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ROCK PRODUCTS

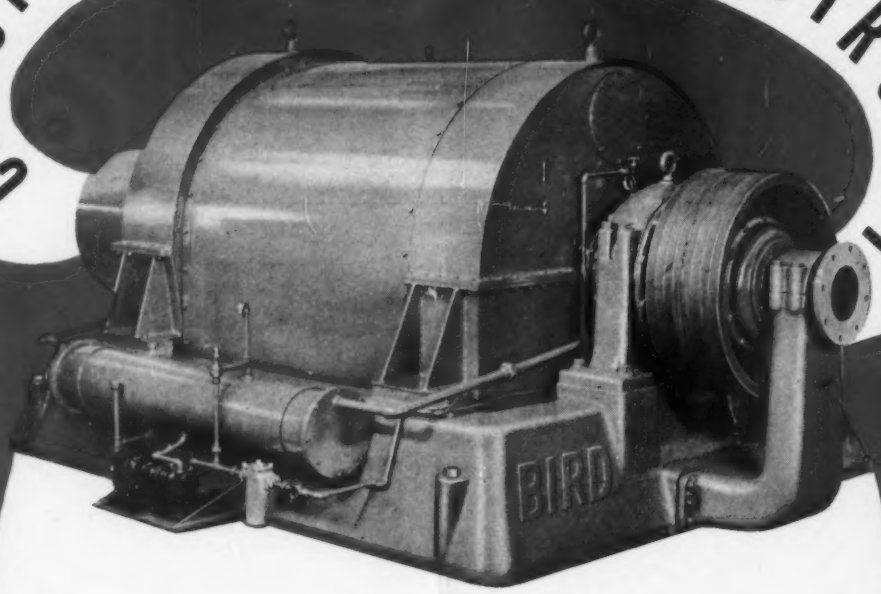
LARGEST NET PAID CIRCULATION IN THE FIELD

OCTOBER, 1946

BULLDOZER — A MULTIPLE UTILITY TOOL

Utilizing Low Grade Coal • Hydraulic Jetting

CLOSING YOUR GRINDING CIRCUIT



Opens The Way To More Profitable Operation

When You Do It With A

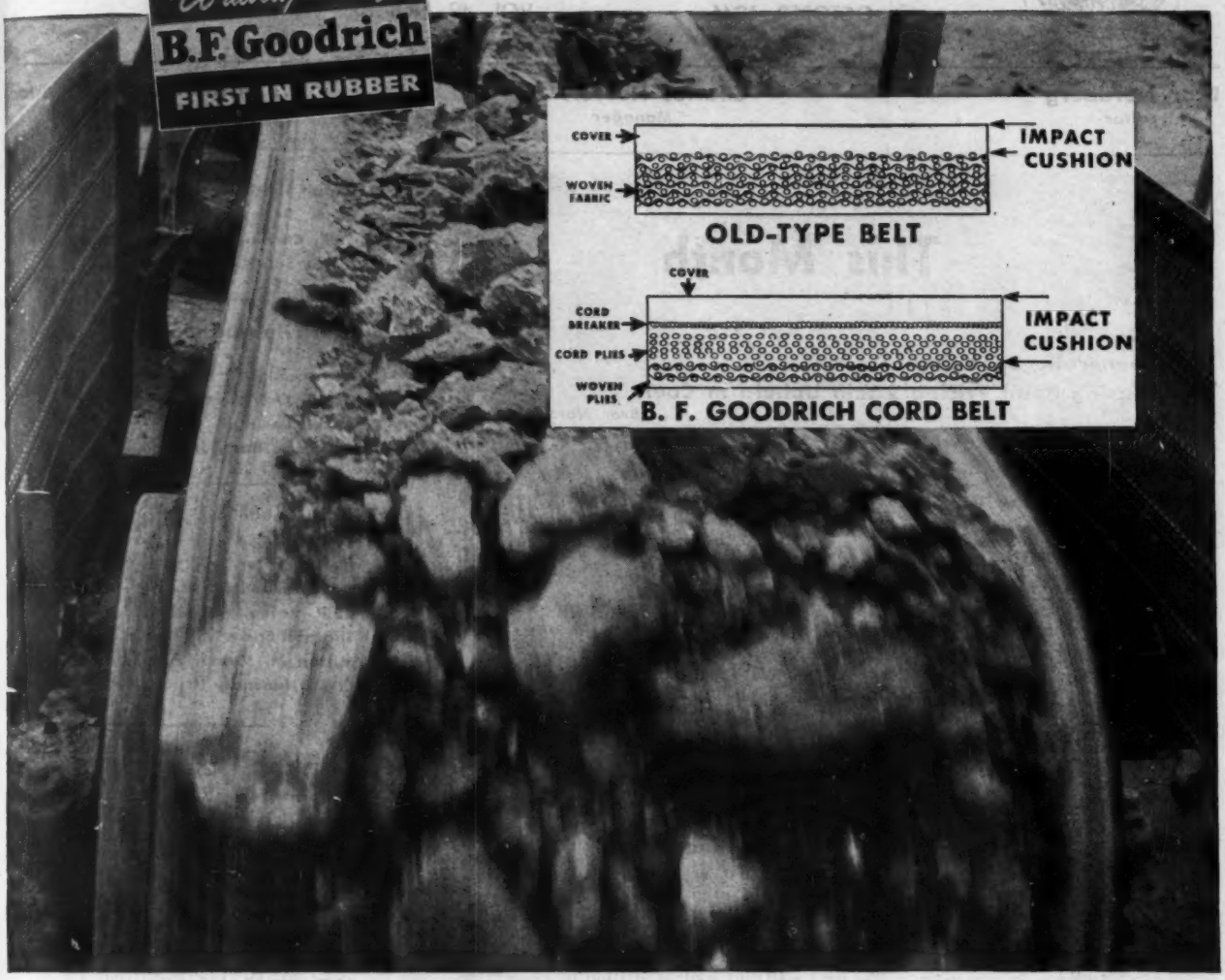
BIRD *Centrifugal* CLASSIFIER

The Bird Classifier whisks the fines out of the slurry just as it comes from the mill. The fines are just right for burning. No thickening is necessary. The oversize returned for regrinding is so clean that milling capacity and efficiency are greatly increased . . . The BIRD does the job continuously, without attention, in small space, at low cost.

Let us tell you more about it.

BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS



B. F. Goodrich cord conveyor belt reduces handling costs, lowers maintenance expense, gives long life with minimum upkeep

Developed for heavy-duty materials handling service

MANY B. F. Goodrich cord conveyor belts have carried 6, 7, 10 million tons of material without appreciable signs of wear. One mine operator in Minnesota reports savings of $30,000 per year by the elimination of transfer points, plus saving all the time and cost formerly wasted in shutdowns and repairs. The cord belt's long life and superior performance result from shock absorbing action that is built into the carcass of the belt.

In this new construction, each cord in each ply is completely surrounded by rubber. Then a layer of parallel cords called a transverse breaker, also embedded in rubber, is laid *across* the belt — floating in rubber above the carcass and covered at the surface by another rubber layer.

Because each cord is embedded in rubber, the impact cushion, as shown in the diagram, is nearly 3 times thicker than in conventional belt construction — impact resistance is nine times as great. The transverse cord breaker absorbs the impact over a greater area and increases adhesion of cover to carcass by at least 50%.

Your service requirements may not call for a heavy duty belt like the cord belt. So remember that there is a B. F. Goodrich belt for *every* kind of service. Be sure to specify B. F. Goodrich. Call your B. F. Goodrich distributor for *all* conveyor belt needs. *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

B.F.Goodrich

RUBBER *and* SYNTHETIC *products*

ROCK PRODUCTS

THE INDUSTRY'S RECOGNIZED AUTHORITY

OCTOBER, 1946 VOL. 49, NO. 10

Bror Nordberg
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Manager

Nathan C. Rockwood
Editorial Consultant

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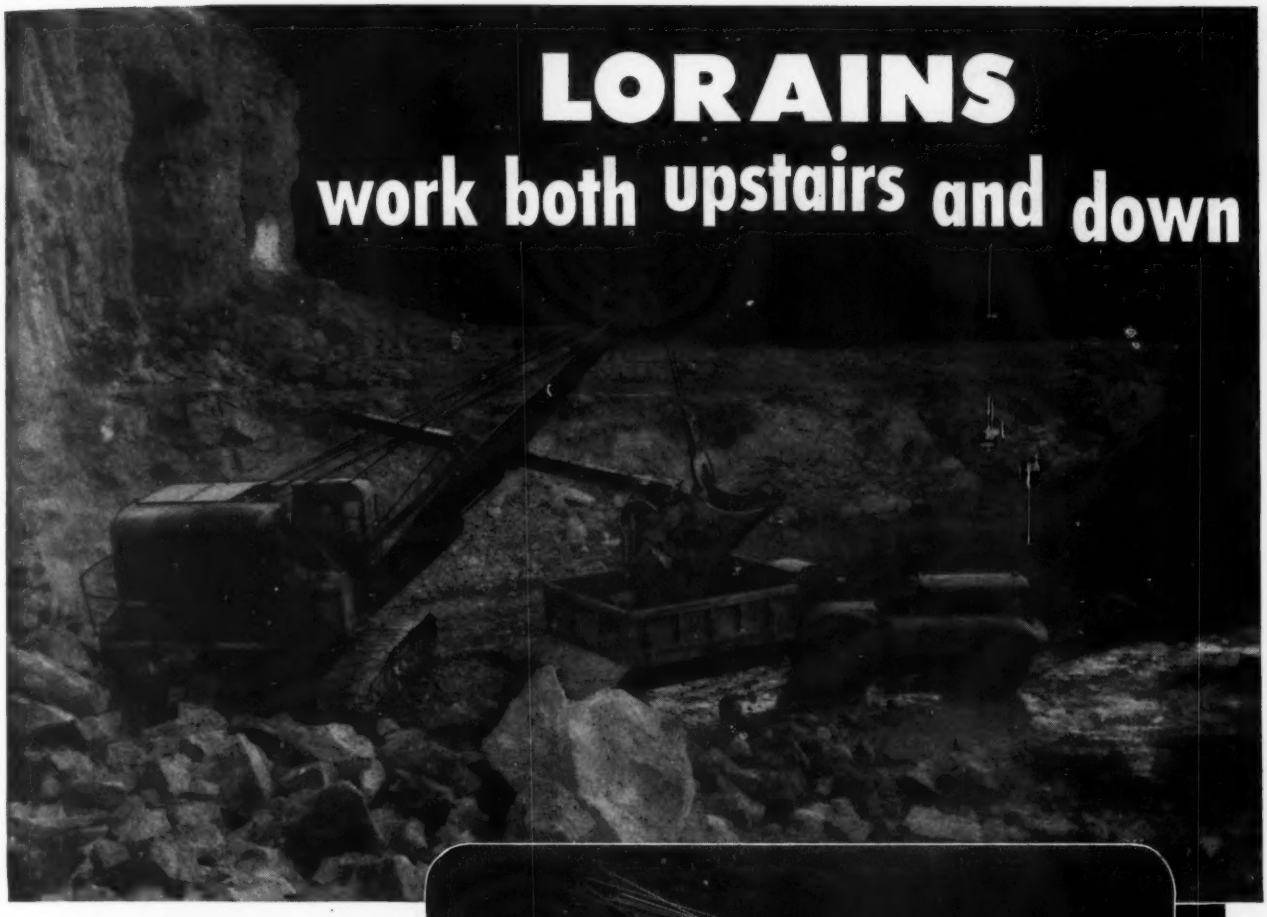
LORAINS
work both upstairs and down



• One works upstairs by sunlight, the other downstairs by floodlight. Both are 2-yd. Lorains. The shovel pictured at top is one of two Lorains owned by the Peerless Lime Co., Missouri, and the unit underground is likewise one of two Lorains operated by the Louisville (Ky.) Crushed Stone Co. Their job — to keep a steady flow of rock moving to the crushers.

The 2-yd. Lorain is a veteran of many victorious battles against rock. Its hydraulic coupling (1) enables digging power to "hang on" like a bulldog and (2) absorbs "rock shock" before it can be transferred to mechanism and cables. Turntable design permits concentration of full engine power on any one operation when needed. Heavy-duty shovel boom and rugged 2-speed chain-drive crawler, complete the specifications for a real rock shovel.

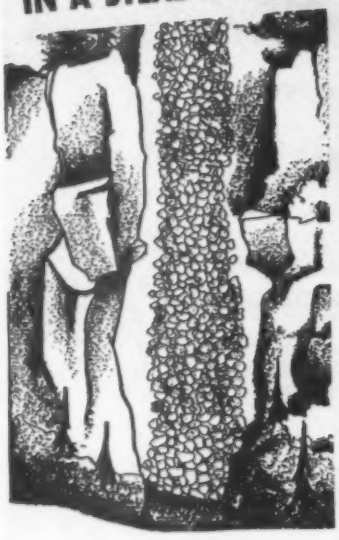
If you want to convert the tough rock jobs into routine work, see your nearest Thew-Lorain distributor, now, for complete facts on the 2-yd. Lorain.

thew Reg. Trade Mark **Lorain**

THE THEW SHOVEL COMPANY
LORAIN, OHIO

CRANES • SHOVELS • DRAGLINES • MOTO-CRANES

LIKE A WATERFALL MATERIAL FLOWS IN A STEADY STREAM FROM UNIVERSAL "STREAM-FLO" ROCK AND GRAVEL PLANTS

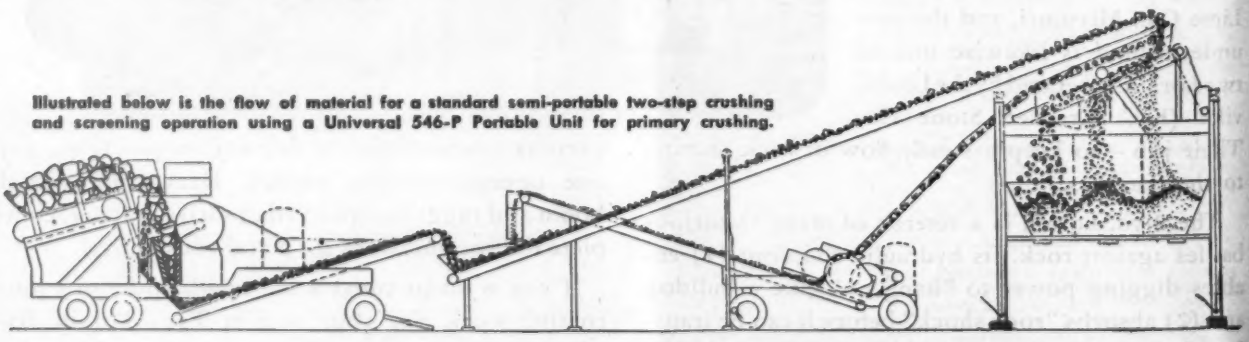


THE UNIVERSAL 546-P PORTABLE PRIMARY CRUSHING UNIT

Built to stand up under high speed production, the 546-P Primary Crushing Unit steps up the output of any secondary crushing plant. It can be used to convert your gravel plant to handle rock, or to increase the efficiency of your rock plant by eliminating sledging or pop shotting of large oversize.

The 546-P provides a steady stream of ideal sized material. When teamed up with a gyrating screen and a Universal Pulverizer, it produces unbelievable quantities of aglime with remarkable economy. Easily moved from job to job, the 546-P meets today's production needs of highest capacity at lowest cost.

Illustrated below is the flow of material for a standard semi-portable two-step crushing and screening operation using a Universal 546-P Portable Unit for primary crushing.



More and more cost-wise operators are profiting with the 546-P. For complete information see your Universal distributor or write for Bulletin No. 56.

UNIVERSAL
ENGINEERING CORPORATION
617 C Ave., N. W., Cedar Rapids, Iowa

ROCK, GRAVEL AND LIME CRUSHING PLANTS • CONVEYORS
SCREENING OR WASHING PLANTS • APRON FEEDERS

Here's what your money buys in a NORTHWEST

INDEPENDENT CROWD plus AUTOMATIC CROWD
FOR GREATER DIGGING POWER
The DUAL CROWD

- **Simplicity of design**
  —for easy upkeep in remote areas.
- **The Northwest Dual Independent Crowd**
  —utilizes force other shovels waste.
- **Cast Steel Bases with Cast Steel Machinery Side Frames**
  —plenty of strength—keep shafts in alignment.
- **"Feather-Touch" Clutch Control**
  —easy operation without fear of shut down because of control failure.
- **Cushion Clutch**
  —reduces overloads on parts under power in heavy digging.
- **Helical Gear Drive**
  —there is no finer power take-off.
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  —trouble-free—fewer adjustments—smooth operation.
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  —minimum loss of power to friction.
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  —makes possible quick conversion for stripping or handling materials or machinery around the plant.

Here is a combination of features you won't find on any other make of machine—it's a real Rock Shovel—a Mine and Quarry Shovel that has proved itself in rock and hard digging everywhere. There is a size for every problem. Let us send you details on the size machine that interests you.

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...it's a ...Rock Shovel ...won't have ...orry about ...put in dirt

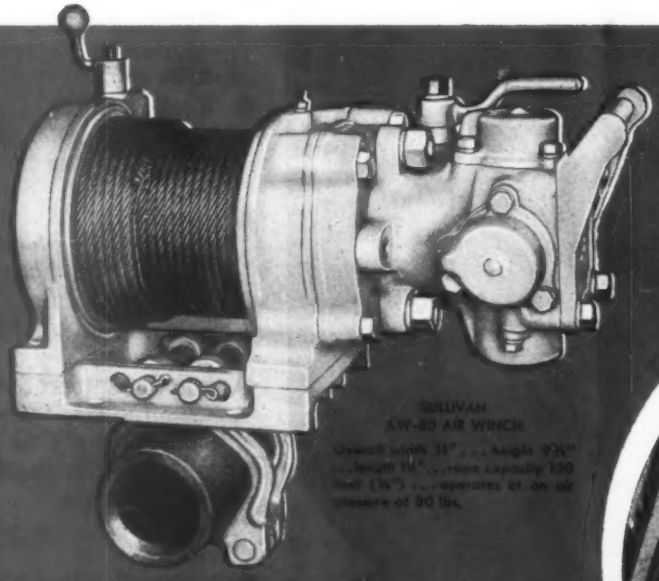
NORTHWEST

Bantam weight-lifting Champ!

NEW MODEL AW-80

AIR WINCH

YOU'LL FIND A THOUSAND USES FOR IT!



SULLIVAN
AW-80 AIR WINCH
Overall width 11" . . . height 9⅞" . . . length 14" . . . rope capacity 150 feet (⅜") . . . operates at an air pressure of 90 lbs.

SAVES TIME AND MANPOWER

WEIGHS ONLY 85 POUNDS
. . . WILL LIFT 500 POUNDS

You'll say it's the most versatile and easy-to-operate winch you've ever seen! The Sullivan AW-80 Air Winch can be moved quickly from place to place to provide positive, closely controlled lift or pull. It's reversible and can be mounted on timber, column or bar.

Air and Electric Hoists of Many Types . . .

SULLIVAN

W&D M499

Consult a Joy Engineer

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JOY MANUFACTURING COMPANY
General Offices: Henry W. Oliver Bldg., Pittsburgh, Pennsylvania

RESULTS MEAN PROFITS

Every operator is interested in the profit he makes. Therefore, he needs machinery in his plant that will produce the results which mean profits to him.

That is why Traylor Compartment Mills "fill the bill." They have built into them the very features that operators demand for results:

1. There is a size to fit your needs. They are built in one, two, three or four compartments, in sizes up to 8'-0" dia. x 50'-0", depending upon the work to be done.

2. They are sturdily constructed to stand up under severe and continuous service. There is a full welded steel shell; extra long trunnions of large diameter; heavy support bearings; reversible cut gearing for positive action and quiet running.

3. Whatever the fineness of the product desired, be it 99% through a minus 325 mesh screen or 100% through a minus 200 mesh screen, these machines deliver the required amount hour after hour.

4. They operate economically and require very little attention by the machine attendant.

All of these add up to the "EFFICIENCY" for which Traylor Compartment Mills are noted and which makes them preferred by many in the cement and metallurgical industries because the results they produce mean profits to the user.

Investigate this mill. Our representative will be glad to come at your convenience to discuss it with you. Or write for further details.

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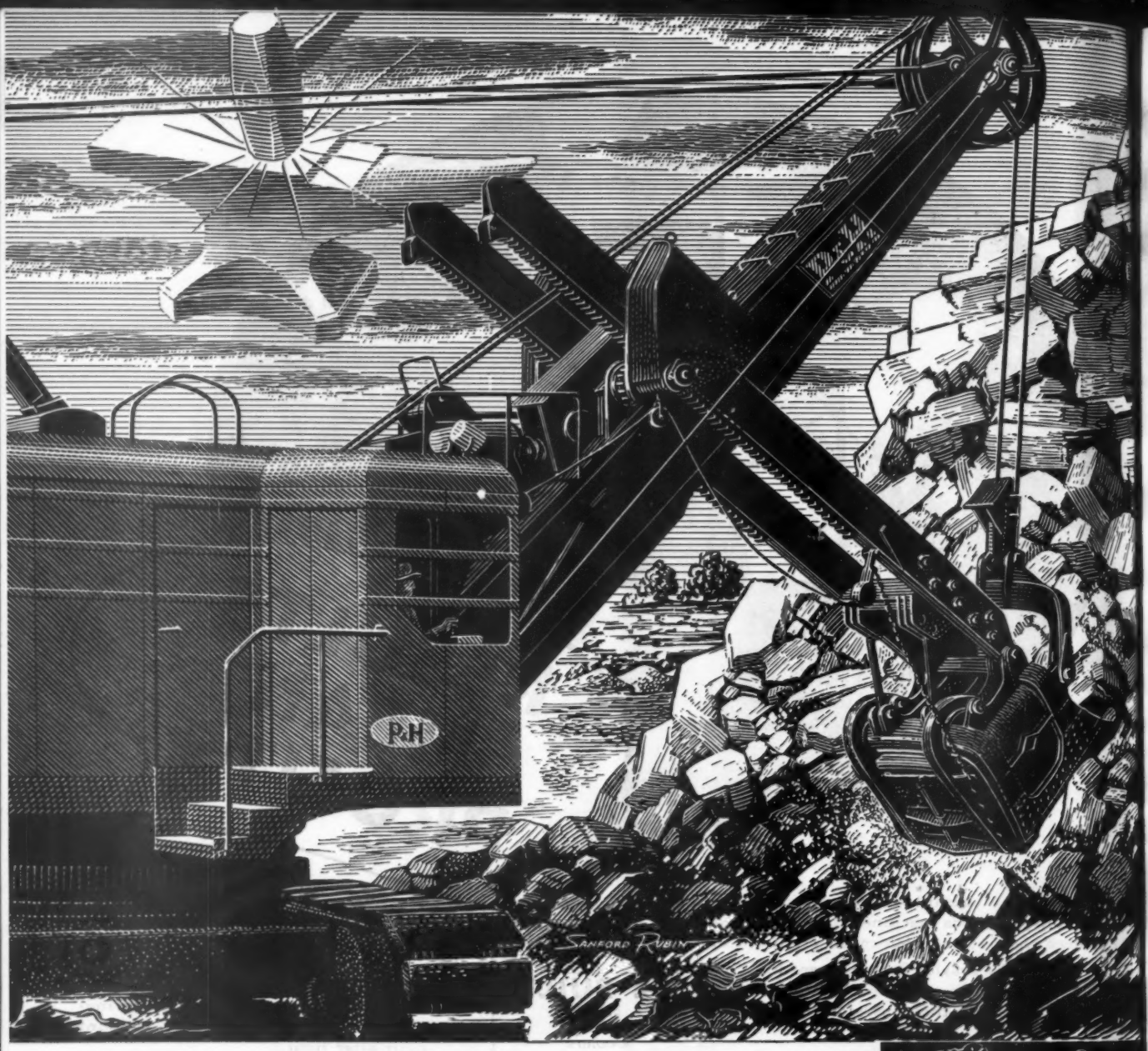


Built for a LIFE-LONG Beating

Smacko! When these big dippers bite into the rock bank, shock loads travel from one end of the machine to the other — seeking vulnerable spots that might weaken on repeated impact.

But P&H Electric Shovel construction is shock-proof — built of rolled alloy steels, *all welded*. Far stronger, far tougher, their rigid strength is assured year after year.

Using deep box section construction — the strongest design principle known — such assemblies as boom, carbody and revolving frame are each welded as integral units. This one-piece construction is weave-proof.

It provides maximum shock resistance. Alignment of machinery is permanent.

P&H originated all-welded construction of excavators. This longer and broader experience provides added values in steadier production, less lay-up time, and far lower maintenance cost.

It will pay you to learn about all of P&H's Added Values when you're in the market for an electric shovel.

P&H ELECTRIC SHOVELS

HARNISCHFEGER CORPORATION

4465 W. National Ave. Milwaukee 14, Wis.

LEADING THE WAY IN ELECTRIC SHOVEL DEVELOPMENTS

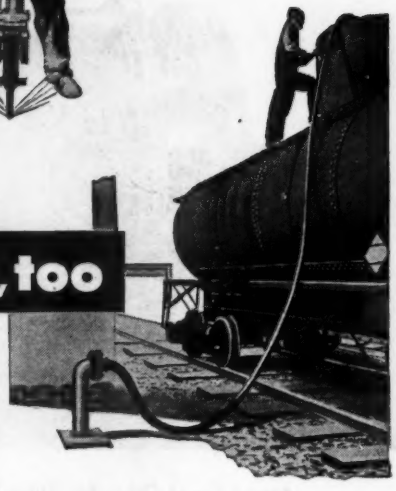
HELPFUL HOSE HINTS

A is for AIR hose

meaning Goodyear Emerald Cord, first choice of industry for long-wearing, heavy-duty service on air tools

-and ACID hose, too

another Goodyear leader you ought to know



YES, Goodyear Acid Suction and Conducting Hose is standout, too, in its field. It is made in four styles, built of different compounds that, among them, withstand practically all types of commercial solutions — including solutions containing 75% phosphoric acid or 50% sulphuric—used in steel mills; tanneries; fertilizer, starch, vinegar, chemical and general industrial plants.

Just tell the G.T.M.—Goodyear Technical Man—what you are handling and he will specify the right hose for any job. Like all Goodyear Industrial Rubber Products — Belting, Hose, Molded Goods, Packing—you'll find it tops in performance, lowest in ultimate cost. To order: phone your nearest Goodyear Industrial Rubber Products Distributor, or write Goodyear, Akron 16, Ohio or Los Angeles 54, California.

Emerald Cord—T.M. The Goodyear Tire & Rubber Company

GOODYEAR INDUSTRIAL RUBBER PRODUCTS

GM-Specified STYLE M ACID CONDUCTING HOSE

for general chemical service

A Tube of long-lived, acid-resistant stock, withstands temperatures up to 150° F.

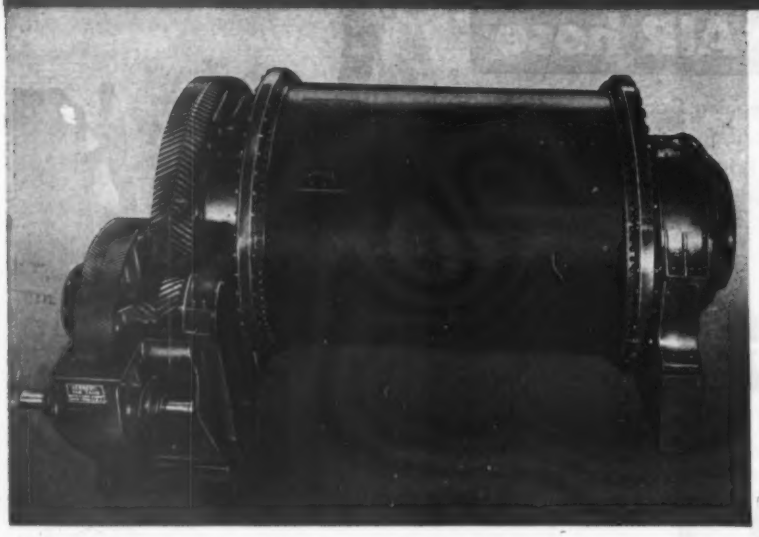
B Cotton fabric carcass, each ply frictioned with high-quality rubber firmly bonding tube to cover. Protected from chemical attack by heavy rubber caps at each end.

C Cover of tough, abrasion-resistant black compound, proof against same acids as tube.

GOODYEAR

THE GREATEST NAME IN RUBBER

KENNEDY *gives you*



WE MANUFACTURE MACHINERY FOR A COMPLETE CEMENT PLANT . . .

KENNEDY INTEGRAL GEAR DRIVEN TUBE MILL

The new KENNEDY Integral Gear Drive for Tube Mills can be used on Combination Ball Mills, Wet Grinding Tube Mills, Dry Grinding Tube Mills and Air Swept Tube Mills. It is impossible to mis-align these gears because the gear housing supports both the discharge end of the mill and the roller bearings carrying the gears. All bearing seats are machined in a jig at the factory to a tolerance of 3/1000 of an inch. The assembly of the gear is exactly the same as the reduction gears which everyone knows is the correct way of transmitting power. Thus we save approximately 10% in power over other best well-known types of tube mill gear drives, which means that one can obtain 10% greater production from a given size Kennedy tube or ball mill with a given size motor.

KENNEDY ROTARY KILN

10' x 9' x 250'

Mounted on 4 riding rings. These kilns can be built in any diameter or length desired. We are prepared to furnish complete cement plants and mining plants.

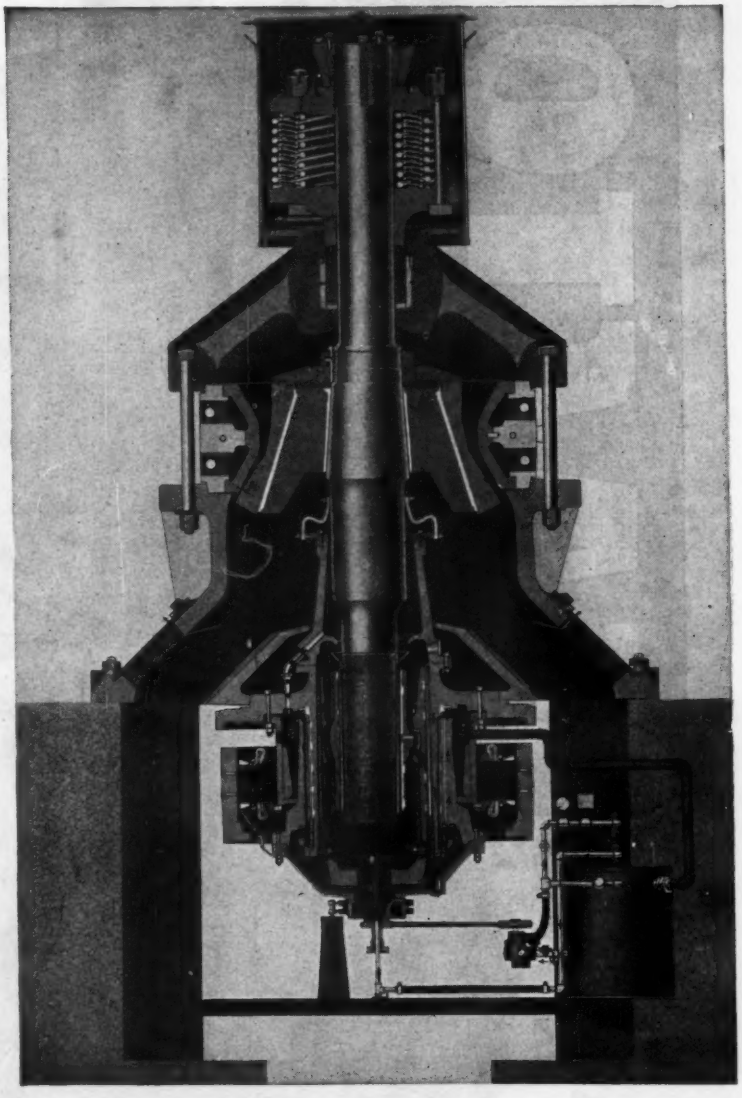
KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

Efficient, Reliable Performance!

A #49½ KENNEDY BALL BEARING GEARLESS CRUSHER

with a Synchronous Motor built in its pulley. This machine shows **80% saving in the cost of maintenance** and a saving of **50% in power** over geared crushers. It has produced 156 tons per hour when set to 7/16" between the head and concaves at the bottom.

Write for information on KENNEDY Ball Bearing Gearless Standard and Secondary Crushers, Jaw Crushers, etc.



We also manufacture Vibrating Screens and Belt Conveyors. Write for Catalogue and description.

2 PARK AVENUE • NEW YORK 16, N. Y. FACTORY: DANVILLE, PA.

BALANCE YOUR PLANT LAYOUT with EASTON Trailers

You can expect lower plant operating costs and more satisfactory production

EASTON TR-10 TRAILER (above), capacity 13-15 tons, has proved to be an ideal transportation unit for average rock and ore handling service.

EASTON TR-13 TRAILER (above), capacity 15-17 tons, is delivering bigger payloads at lower cost on several installations.

EASTON TR-15 TRAILER (right), capacity 18-20 tons, is helping to balance plant production costs where big shovel and crusher equipment must be served dependably.

J-1021

You can expect lower plant operating costs and more satisfactory production from the moment you put the right containers into your haulage system . . .

Your haulage problem is different—because your entire plant layout, your shovels, your crushers, and your production requirements are different. The most important step in setting up your transportation system is to put the *right containers* under your shovel dippers and at your dumping point. In either track or trackless haulage the wrong type and size of container will throw the rest of your plant layout out of balance.

We should like to point out that an increasing number of leading operators have already modernized their haulage by changing over to EASTON TRAILERS. The most popular models are the EASTON TR-10, TR-13 and TR-15, ranging from 13 to 20 tons payload capacity. These models feature the EASTON PHOENIX side-dump, doorless container.

An EASTON PHOENIX TRAILER may be the right answer for you—or you may require a special type of EASTON-engineered container for track, truck or tractor haulage. For a practical engineering recommendation on the *right* size, type and number of containers for your plant we suggest that you write for your free copy of the new EASTON Transportation Statement, Form 176. Write or call to: Engineering Counsel, Easton Car & Construction Co., Easton, Pa.

EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA.

"Little" 25-tonner saves valve maker

This 25-ton G-E diesel-electric handles cars of heavy raw materials and finished valves between the plant and connecting railroads.

ONE SHIFT OR THREE SHIFTS, THEY PAY THEIR WAY

1. ALWAYS READY FOR WORK The diesel-electric starts at the push of a button. No unproductive time is spent tending the locomotive or getting it ready for work.

2. AVAILABILITY—90 PER CENT UP Stops for fuel are ordinarily several days apart. Inspection and overhauls just a few hours a month at scheduled intervals. During rush periods, many G-E diesel-electrics have remained "on-the-go" for several months at a stretch.

3. LOW FUEL COSTS At Chapman Valve, fuel costs of the diesel-electric are *one-fifth* of those for the supplanted old steam locomotive. Fuel is used only when work is actually being done—so intermittent use shows big savings.

4. CLEANER, QUIETER OPERATION Absence of smoke and excessive noise permits use close to and within buildings. Use of a diesel-electric reduces the fire hazard, too.

5. MAINTENANCE CUT Maintenance and engine-house expense of the G-E diesel-electric consistently runs lower than for any other type of switcher. Its smooth torque at the wheel rim cuts track maintenance as well.

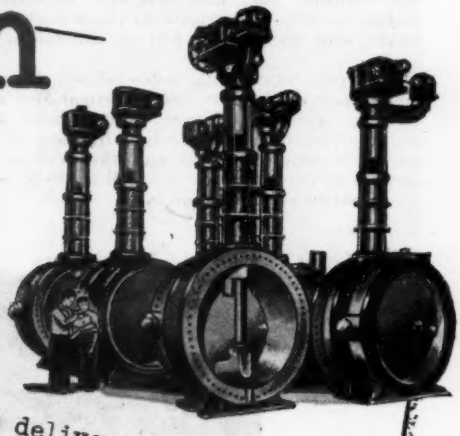
6. HIGH RETURN ON INVESTMENT Even on one-shift operation, the operating savings of a G-E diesel-electric will generally enable it to pay for itself in six years or less. In many cases, cost records of busy wartime use have shown a 30 per cent return on investment.

GE

diesel-electric *Industrial* LOCOMOTIVES

A standard line—built for stock—quick delivery—low cost

speeds switching 33%
$270 a month



When a G-E 25-ton diesel-electric was delivered to the Indian Orchard (Mass.) plant of The Chapman Valve Manufacturing Company, the engineer looked at it dubiously. It looked too small to be a successor to the heavier steam locomotive that had broken down under severe wartime service.

Now the same engineer says: "I like everything about it. This is my fifth locomotive, and there's no comparison to be made that doesn't favor this G-E diesel-electric."

The 25-tonner has speeded up plant switching schedules at least one-third. It met 72-hour week operating conditions without fail. The tarpaulin on the "stand-by" steamer has never been removed since the diesel-electric went into service in June, 1944.

Within the company's business office, less than 40 feet from the tracks, the cleaner, quieter operation of the diesel-electric has been a welcome relief. Even more welcome to the business office, however, are the operating-cost figures which have shown average operating savings of $271.90 per month. Though the present operating rate is 45 hours a week, the locomotive is still earning 20 per cent on the original investment!

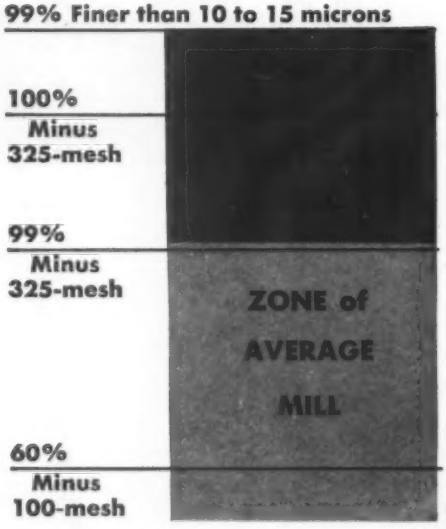
Without obligation, G-E specialists will be glad to survey your plant switching and haulage requirements to bring to light such opportunities for savings. Just call your local G-E office.

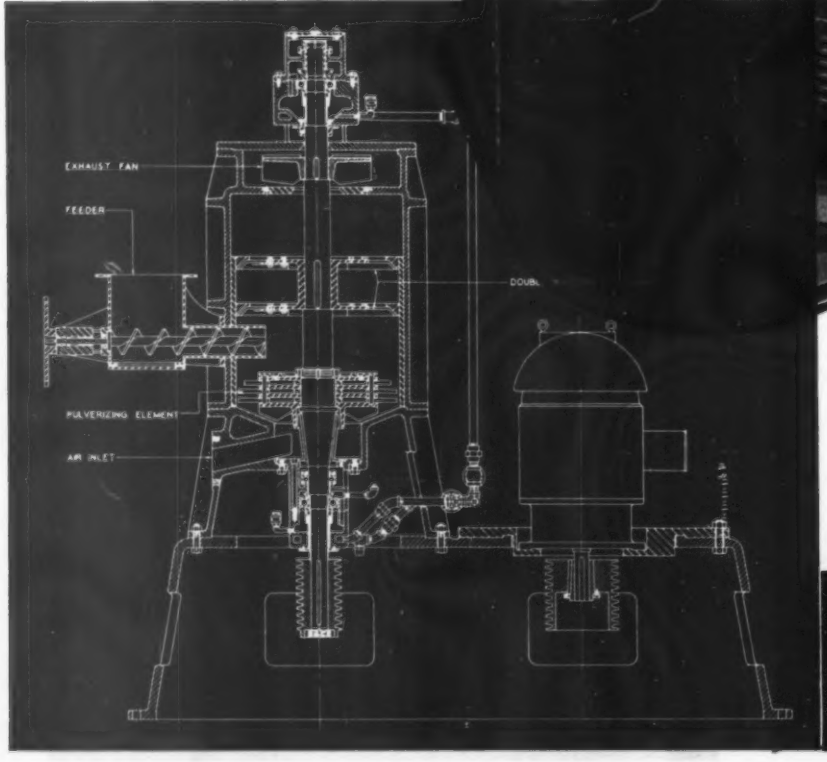
GENERAL ELECTRIC

New High Fineness Available wi

WHEN your product requires pulverizing to extreme high fineness . . . not obtainable with the ordinary grinding unit . . . the Raymond Vertical Mill is the machine for the job. This is especially adapted for the superfine reduction of the medium soft non-metallics, chemicals and similar materials, which will reduce readily by attrition to small particle sizes. It operates in the lower micron range with no material left on 325-mesh.

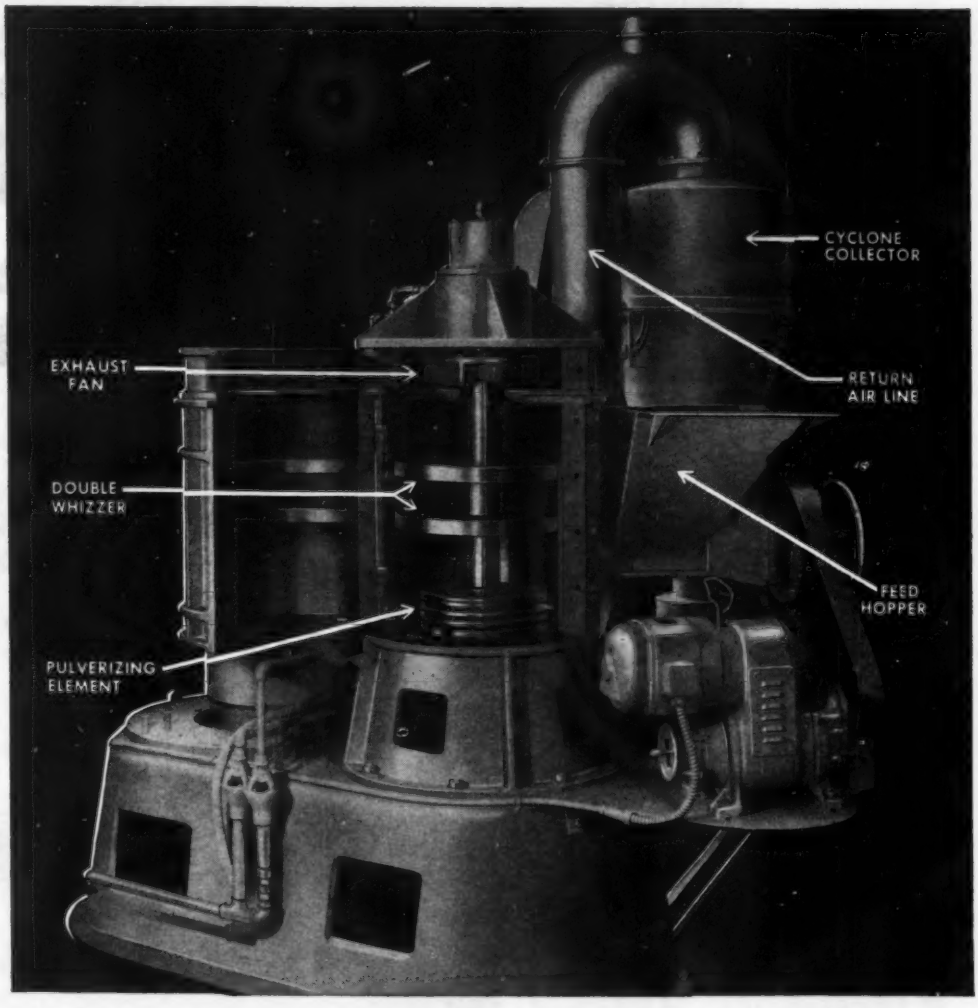
The approximate table below shows the relative fineness range of the Raymond Vertical Mill as compared to the average grinding unit. Where an ordinary commercial mill can reach a fineness of 99% passing 325-mesh at the fine end, the Vertical Mill continues up to particle sizes as small as 99% finer than 10 to 15 microns at the fine end.





VERTICAL MILLS are built in two sizes:—18" and 35" diameter of grinding chamber for small and large capacities. If you will write us, stating your problem, type of product, specifications of finished material and output desired, we can give you detailed information on mill performance.

with the Raymond Vertical Mill



SINCE 1887

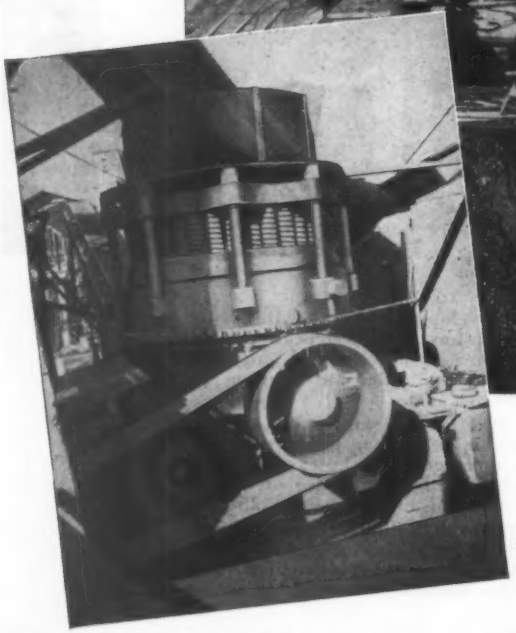
Write for VERTICAL MILL Bulletin No. 57

THE VERTICAL MILL is the latest development in the Raymond line of pulverizing and separating machinery. It has been tested in commercial applications for several years on such materials as chemicals, dry colors, dye-stuffs, pigments, non-abrasive clays, graphite, talc and various other non-metallic minerals.

Typical installations of the Vertical Mill are operating successfully, as for example on the superfine grinding of graphite for lead pencil manufacture; for pulverizing and intermixing various water colors; for the extreme fine pulverizing of talc; for the reduction of a chlorine chemical; also on dry colors and dye-stuffs, in which *all* the finished material must pass a 325-mesh screen.

The Vertical Mill is efficiently adapted for handling the softer non-metallics, such as barytes, limestone, talc, marble chips, china clay, kaolin, certain pigments and manufactured chemicals. Tell us your problem and our engineers will advise you on the possibilities of the Vertical Mill for your particular job.

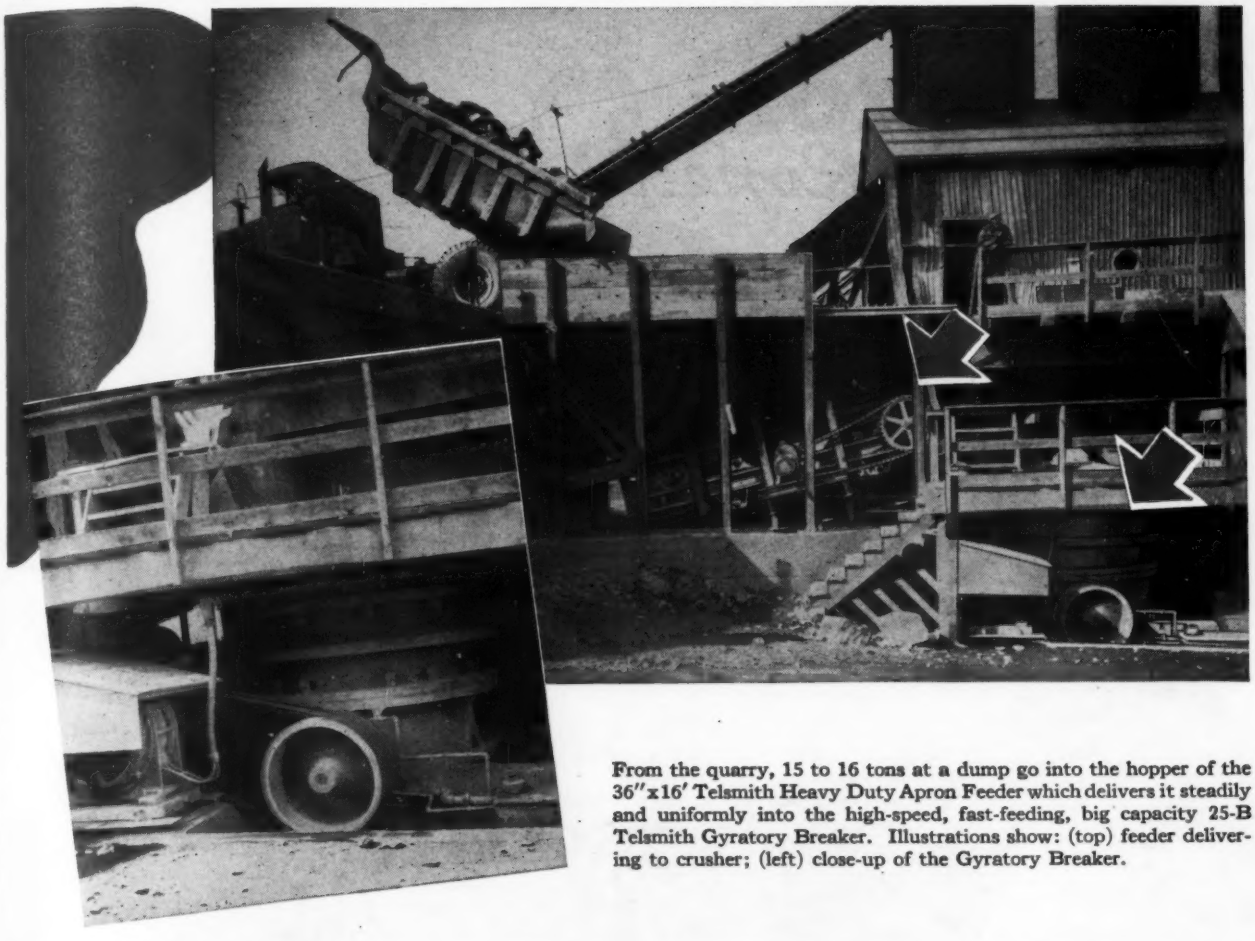
NEW FLEXIBILITY! MORE CAPACITY particularly in smaller sizes by modernizing with TELSMITH



Recently modernized to turn out 150,000 tons yearly, the Ashcom, Pa. plant produces agricultural and chemical limestone, burned lime products and aggregate stone. It is one of four Telsmith-equipped quarry plants of the New Enterprise Stone & Lime Co.

This 48" Telsmith Gyrasphere Secondary Crusher, and a Telsmith 36" Gyrasphere finishing crusher in the main plant, give top tonnage of small sizes, particularly fine chips.

TELSMITH



From the quarry, 15 to 16 tons at a dump go into the hopper of the 36″x16′ Telsmith Heavy Duty Apron Feeder which delivers it steadily and uniformly into the high-speed, fast-feeding, big capacity 25-B Telsmith Gyratory Breaker. Illustrations show: (top) feeder delivering to crusher; (left) close-up of the Gyratory Breaker.

● The New Enterprise Stone & Lime Co. couldn't afford a long shut-down of their Ashcom, Pa. plant. Existing railway tracks, state highway, permanent buildings, saving an old log cabin of colonial days and limited space—all made plant modernization a tough job. Telsmith engineers, devising an ingenious conveyor and scalper arrangement, took only 8 production days to make the change-over.

Limestone from quarry is fed by a 36″ x 16′ Telsmith Heavy Duty Apron Feeder to a 25-B Telsmith Gyratory Breaker. The product from the 25-B is carried by 36″ Telsmith Conveyors to a 5′ x 12′ Double Deck combination scalping and preliminary sizing screen located over a 3-compartment bin. Oversize from scalper goes to a 48″ Telsmith Gyrasphere Crusher. The three bin sizes can be discharged into trucks, or be fed to a 30″ Telsmith Main Plant Conveyor located beside bin and under 48″ Gyrasphere Crusher. This Conveyor also extends back under a hopper to receive stock pile materials for re-washing, re-screening or further crushing.

The main plant conveyor carries over a railway siding and state highway, and feeds by flap gate either to the main 4′ x 12′ Telsmith 3-deck sizing screen located over main dry sizing bin, or to a washing plant, or to both. One or more sizes from main sizing screen can go to a 36″ Telsmith Gyrasphere finishing crusher, the product from the latter being elevated to two 3′ x 10′ Telsmith 3-deck Pulsators over chip bins. Another 4′ x 10′ Telsmith Double Deck Pulsator sizes stone in washing plant. Ingenious design and arrangement makes this plant extremely flexible and efficient.

Modernizing, expanding, or planning a complete new quarry or gravel plant? Consult Telsmith engineers . . . get Bulletin E-11.

QS-3

SMITH ENGINEERING WORKS, 508 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

51 East 42nd St. New York 17, N.Y. | 211 W. Wacker Drive Chicago 6, Ill. | 713 Commercial Trust Bldg. Philadelphia 2, Pa. | 247 Third St. Cambridge 42, Mass. | Boehck Eqpt. Co. Milwaukee 3, Wis. | Mines Eng. & Eqpt. Co. San Francisco 4—Los Angeles 14

Clyde Equipment Co., Portland [illegible] 4, Wash. • Brandeis Machinery & Supply Co., Louisville 8, Ky. • Southern Eqpt. & Tractor Co., Monroe, La. • Rish Equipment Co. [illegible] 22 & Clar[illegible]burg, W. Va.—Roanoke 7 & Richmond 10, Va. • Wilson-Weesner-Wilkinson Co., Knoxville 8 & Nashville 6, Tenn.

Equipment

union Wire Rope

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Office and Warehouse, 2415 N. W. 22nd St., Tel. Broadway 9475, C. D. Schooley, Dist. Mgr.

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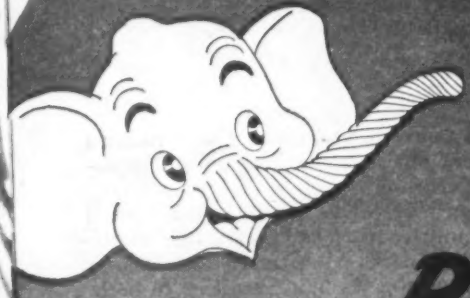
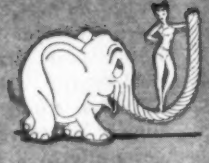


union-formed *For Long Lived* PERFORMANCE

UNION-FORMED SPOOLS BETTER . . . even with a light load it winds evenly and tightly.

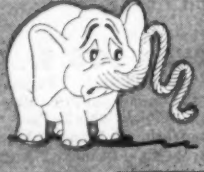


UNION-FORMED RESISTS KINKING . . . because wires and strands are free of internal stress, they do not fight to get out of their preformed positions.

UNION-FORMED HAS GREATER RESISTANCE TO BENDING FATIGUE . . . withstands more bends, even reverse bends, because it is more stress-free internally.

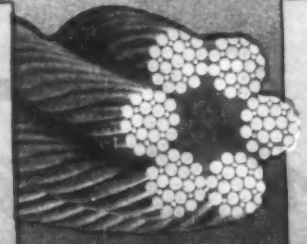
UNION-FORMED RIDES BETTER ON GROOVES . . . does not spin over sheaves or grind through blocks.

UNION-FORMED IS SAFER TO HANDLE . . . worn, broken wires do not spring out and porcupine but continue to lie close to the rope.



UNION-FORMED IS FLEXIBLE and RELAXED . . . bends in any direction, yet has "toughness" to withstand jerking and other punishing strain.

union-formed
(Preformed)



THE ULTIMATE LOW COST
WIRE ROPE

union Wire Rope

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Union's Specialists Cover the Map to Give You Unmatched WIRE ROPE SERVICE

Union's is an organization of specialists which devotes its whole time to bettering wire rope.

Here pictured is an important part—the link between user and Union's laboratory and factory. This staff of field specialists man Union's branch warehouses and offices. It works in the field with strategically located distributors.

This not only provides wire rope users with an S. O. S. (service on schedule) source of supply close at hand — it also equips each outlet with the extra "know-how" for proper wire rope application. The end result is better service from better wire rope better fitted to the individual machine and job.

You are urged to make full use of Union's staff of factory-trained field specialists and Union's library of books on wire rope usage.

UNION WIRE ROPE CORPORATION

2156 MANCHESTER AVE.
KANSAS CITY 3, MISSOURI

Send wire rope books as checked:

- ☐ Steel Tendons of Industry
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- ☐ Splicing Wire Rope
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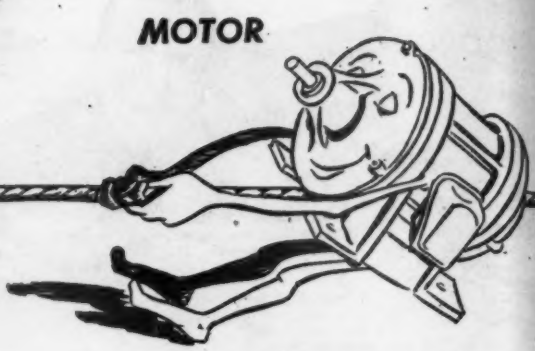


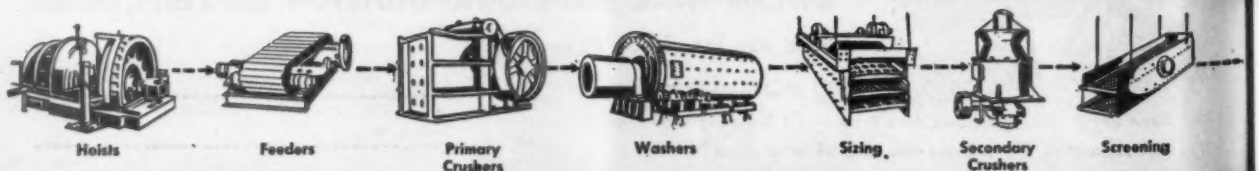
"All Three

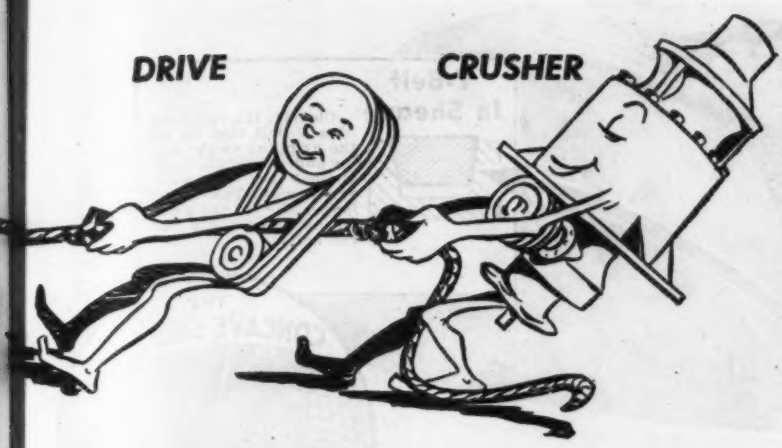
YOU GET BETTER ALLIS-CHALMERS

NINE WAYS TO SAVE WITH A-C TYPE "R" CRUSHER...

1. **Large feed opening** takes unregulated feed, eliminates need for feeders.
2. **Recessed spider cap** adds to crusher life.
3. **Concave ring** can be inexpensively replaced.
4. **Crushing chamber** designed for high capacity.
5. **Exclusive "Speed-Set" control** instantly regulates product to exact size required.
6. **Dust seal** protects internal working parts.
7. **Flood lubrication** reduces wear, maintenance.
8. **Relief valve** protects crusher from damage.
9. **Hydraulic jack** cuts outage time, quickly restores crusher to duty after interruptions.

ALLIS CHALMERS





Pull Together"

"PULLING-TOGETHER" POWER WITH MOTOR-DRIVE-TYPE "R" CRUSHER UNIT

HERE'S A TEAM-UP THAT REALLY PAYS OFF . . . in convenience . . . in better crushing . . . in lower crushing costs! When you get your Type "R" Reduction Crusher *complete* with motor and drive from Allis-Chalmers you get also Allis-Chalmers' assurance that the combination will perform properly under *any* operating conditions.

All three—crusher, motor, and drive—work together as a smooth-running unit, because both motor and drive are engineered to meet the heaviest-going power demands of the crusher. Mechanical and electrical factors are matched for best efficiency . . . best economy.

Your crusher arrives as a *complete* unit . . . ready to get into production at once. No expensive delays or troublesome installation worries. Much more convenient. And responsibility for effective performance rests with only one manufacturer — a big advantage. Get in touch with your nearby A-C office, or write ALLIS-CHALMERS, MILWAUKEE 1, WISCONSIN.

A 2090

A-C ROTARY KILNS CONTRIBUTE TO PYRO PROCESSING EFFICIENCY

In the large-scale pyro-processing of cement, lime, ores, oxides, and synthetics, Allis-Chalmers has made a number of significant contributions, both in improved kiln design and in the improvement of auxiliary units. Here are some of these contributions:

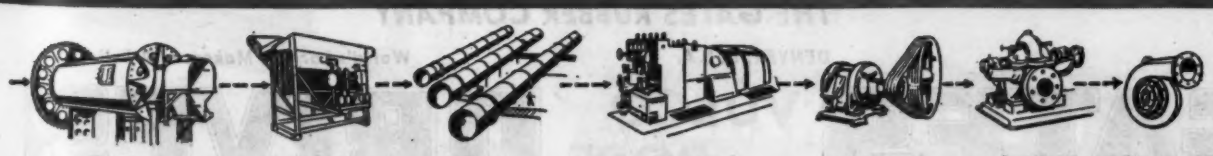
- Allis-Chalmers kiln shells are rolled one plate to the circle . . . resulting in a more truly circular shell, easier lining installation, longer lining life.

Allis-Chalmers is the World's Largest Builder of Rotary Kilns.

- Fusion-melt welding of kiln shell, riding rings and gears costs less, makes weld as strong as any part of kiln shell.
- Automatic draft control saves fuel, maintains high uniform production rate.
- Effective air seals result in higher thermal efficiencies, heat recovery . . . reduce excess air.
- Centralized instrument control increases kiln efficiency and capacity — improves product quality.
- Heat recuperating chain system improves effectiveness of heat utilization for processing wet materials.

Allis-Chalmers engineers will gladly work with you on your pyro-processing problems. Contact your nearby A-C office, or write direct to ALLIS-CHALMERS, MILWAUKEE, WIS.

One of the Big 3 in Electric Power Equipment
Biggest of All in Range of Industrial Products



V-Belt
In Sheave
Clearly, it's the sides of a V-Belt that do all the gripping on the pulley and get all the wear against the sheave-groove wall. That's why longer life for the sides means longer life for the belt!
THE
CONCAVE SIDE
A
GATES
PATENT

The SIDEWALL of Your V-Belt does MORE Work NOW than ever before!

--that's why the CONCAVE SIDE has become Even MORE IMPORTANT!

The moment you think about it you realize, of course, that the *sidewall* is the part of a V-Belt that really gets the *wear*.

It's the sidewall that has to grip the pulley. It has to pick up all the power from the driver pulley, transmit that power to the tension member and then deliver to the driven pulley all the power that pulley ever receives.

That is the perfectly natural reason why you have always noticed that the sidewall of the *ordinary* V-Belt is the part that wears out first. Clearly, anything that lengthens the life of the sidewall will lengthen the life of the belt.

The simple diagrams on the right show clearly why the ordinary, *straight-sided* V-Belt gets excessive wear along the *middle* of the *sides*. They show also why the Patented Concave Side *greatly reduces* sidewall wear in Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight-sided V-Belts can possibly give.

Straight Sided V-Belt — FIG. 1

How Straight Sided V-Belt Bulges When Bending Around Its Pulley — FIG. 1A

You can actually feel the bulging of a straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall as indicated by arrows.

Gates V-Belt with Patented Concave Sidewall — FIG. 2

Showing How Concave Side of Gates V-Belt Straightens to Make Perfect Fit in Sheave Groove When Belt Is Bending Over Pulley — FIG. 2A

No Bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall—and that means much longer life for the belt!

4610

Stronger Tension Members in Today's Belts Put Even GREATER LOAD on SIDEWALLS!

Now that Gates *Specialized* Research has resulted in V-Belts having much stronger tension members—tension members of Rayon Cords and Flexible Steel Cables, among others—the sidewall of the belt is often called upon to transmit to the pulley much heavier loads. Naturally, with heavier loading on the sidewall the life-prolonging Concave Side is more important today than ever before!

Gates

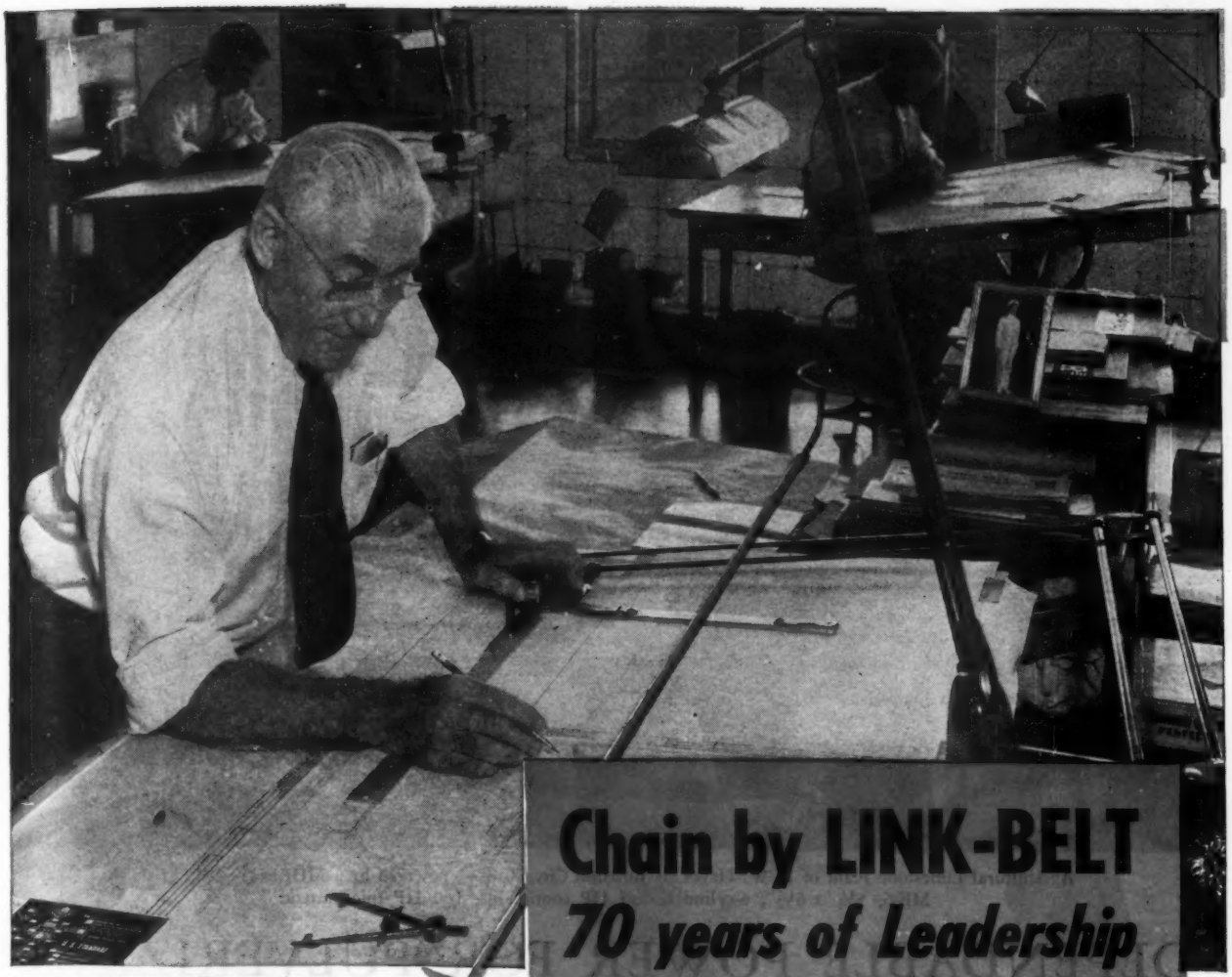
THE MARK OF SPECIALIZED RESEARCH

THE GATES RUBBER COMPANY

DENVER, U. S. A. ***World's Largest Makers of V-Belts***

GATES VULCO ROPE DRIVES

Engineering Offices and Jobber Stocks **IN ALL INDUSTRIAL CENTERS** **of the U. S. and 71 Foreign Countries**



Chain by LINK-BELT

70 years of Leadership

Chain quality starts in design . . . and design "know-how" rests upon experience. Link-Belt has pioneered the use of Conveyor and Drive Chain in American industry for over 70 years. This provides a broad base of operating experience under every conceivable condition. You are assured that "Chain . . . by Link-Belt" can be trusted, fully, to do the job.

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8. Offices, Factory Branch Stores and Distributors in Principal Cities.

10,320

Ewart Detachable Link-Belt. A widely used chain for average service on drives, elevators and conveyors.

"SS" Class Short Pitch. For medium and heavy duty drives; made with offset or straight side bars; with or without bushings or rollers.

"800" Class Chain for heavy duty and severe service condition such as encountered in handling abrasive materials.

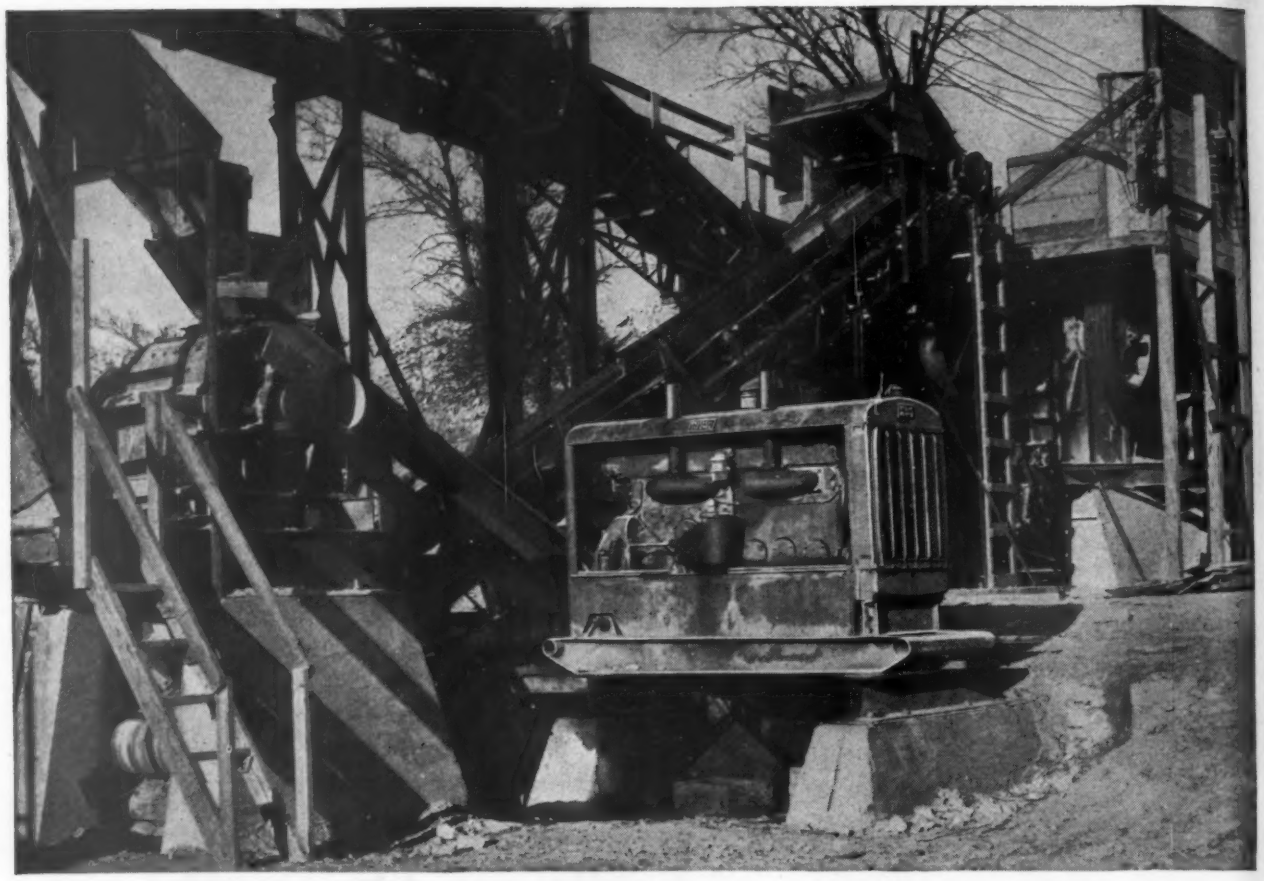
"C" Class Combination iron and steel chain for heavy-duty elevators handling semi-abrasive or sticky materials.

Silverlink Roller Chain for drives and conveyors.

LINK-BELT

CHAINS AND SPROCKETS

for conveyors • for drives • for power transmission



Agricultural Limestone Plant of L. W. Hayes, at Junction City, Kansas, powered by a MURPHY DIESEL ME-6, 5¾" x 6½", 6-cylinder, 135 HP continuous, 160 HP intermittent.

DEPENDABLE POWER FOR PULVERIZING AGRICULTURAL LIMESTONE

MURPHY DIESEL is the rock crusher's answer for power that helps boost total output above average. These rugged, dependable engines have *proved this* to many portable and stationary plant operators.

MURPHY DIESELS are heavy-duty engines, very compact and relatively light in weight, making them ideally adaptable to portable equipment. Economy in operation and maintenance, ruggedness that means long life, simplicity of installation and operation in any climate, and smooth, flexible, dependable power for crushing, assure you of "more power . . . more output . . . more profit."

When buying new equipment or re-powering present machines, specify MURPHY DIESELS.

FIELD-PROVEN *Power*..

More Power MURPHY DIESEL More Profit

121

MURPHY DIESEL COMPANY

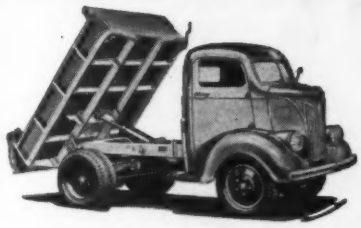
Engines from 90 to 165 H.P. Generator Sets from 60 to 115 K.W.

5315 W. BURNHAM STREET • • • • • MILWAUKEE 14, WISCONSIN

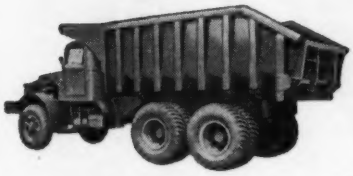
THE BEST COSTS LESS

TRADE MARK

For years Gar Wood has consistently offered truck and trailer equipment of utmost utility and outstanding value. Leadership in this field resulted from this policy. Gar Wood equipment costs less in the long run because it is better built to give peak performance and lasting satisfaction.

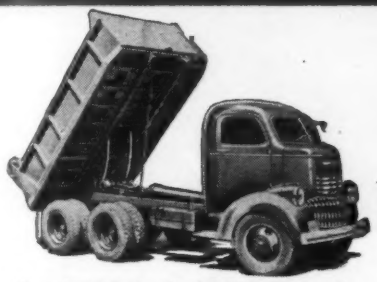


Type C12 Body and Model D6 or D7 Hoist. Dumping angle 55°.

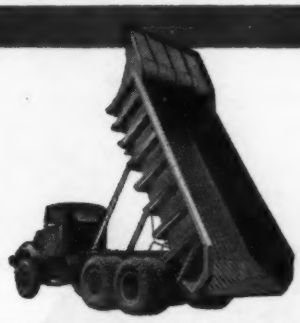


Type X-112 Extra heavy duty Body with automatic downfolding tailgate.

Special rock Body, scoop type rear end. Model F4CA cam and roller Hoist.

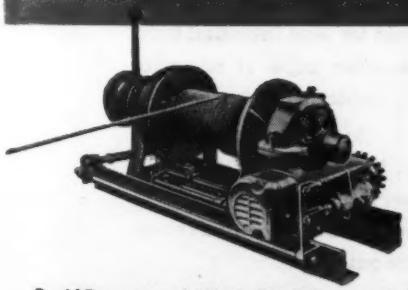


Type W12 Body. Model F4C cam and roller Hoist. Capacity 6 cu. yds.

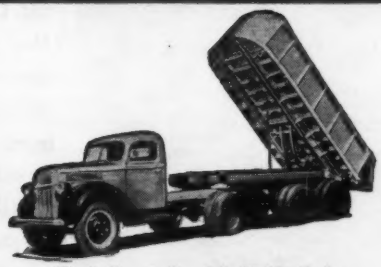


Type X-112 Extra heavy duty Body, scoop end, with Model T-4440 Hoist. Capacity 19 cu. yds.

Type W12 Body, front recessed for Model TV83 Hoist. Capacity 15 cu. yds.



Rapid Reverse truck Winch. Single lever control. Capacities 15,000 to 60,000 pounds line pull.



West Coast Special W-12 Body, Model F8C cam and roller Hoist. Capacity 10 cu. yds.

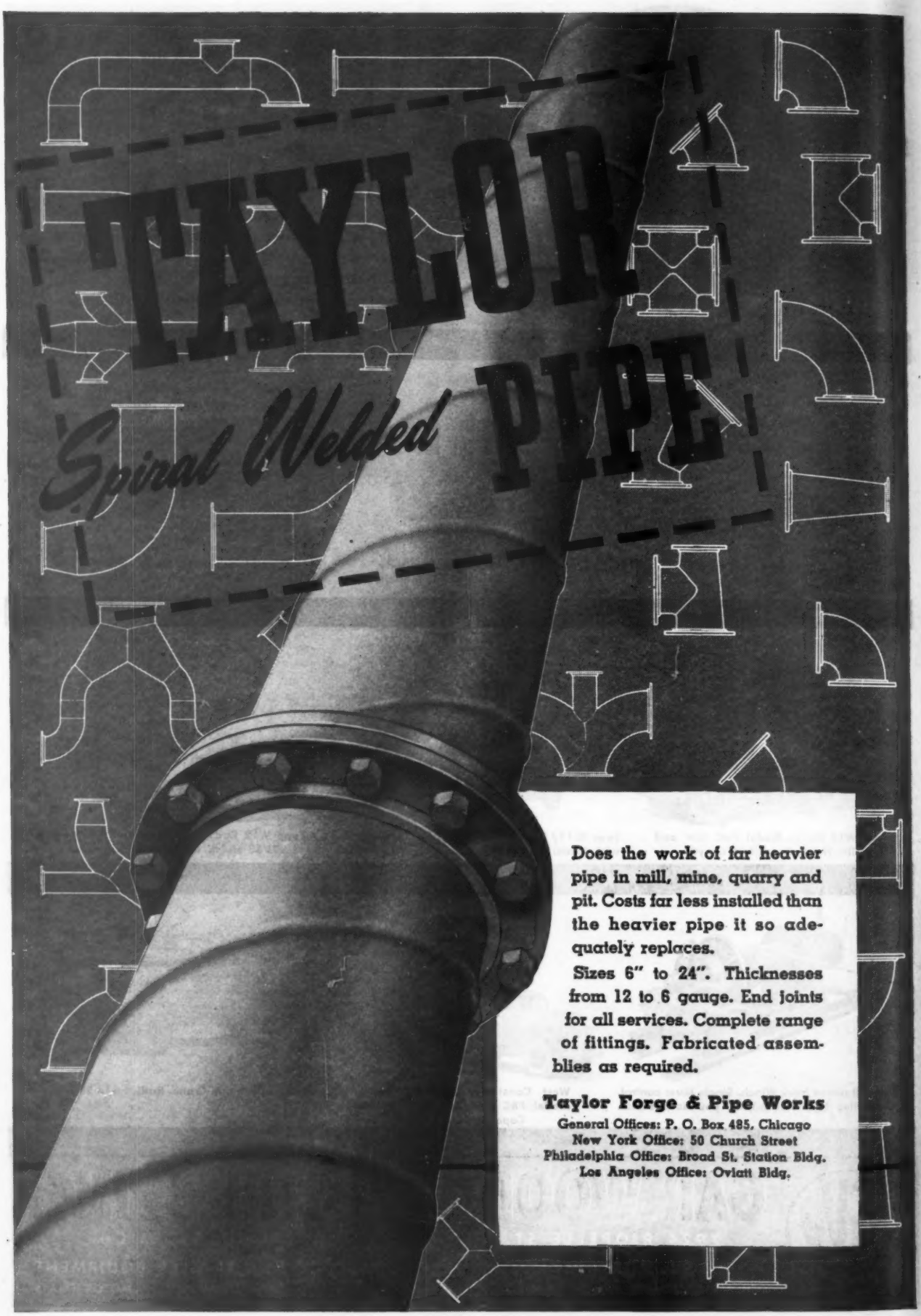
Telescopic boom Crane. Radius 8 to 20 feet.

GAR WOOD INDUSTRIES, INC.

7924 RIOPELLE ST. DETROIT 11, MICH.

WORLD'S LARGEST MANUFACTURERS OF TRUCK AND TRAILER EQUIPMENT

OTHER PRODUCTS: TRUCK TANKS ROAD MACHINERY HEATING EQUIPMENT MOTOR BOATS


TAYLOR
Spiral Welded PIPE
Does the work of far heavier pipe in mill, mine, quarry and pit. Costs far less installed than the heavier pipe it so adequately replaces.
Sizes 6" to 24". Thicknesses from 12 to 6 gauge. End joints for all services. Complete range of fittings. Fabricated assemblies as required.
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Let UNIT *Carry the Ball*

UNIT 357
—5 ton Self-Propelled Mobile Crane on sign erection job. Operated by one man . . . powered by one engine.

UNIT 1020
— ¾ yard Dragline used on large drainage project. Full revolving. Finger-tip controls from FULL VISION cab.

UNIT 1020
— ¾ yard Crawler-type Shovel taking a deep bite on a basement digging job. Assures maximum yardage profits.

When you "go into a huddle" to select that next crane or shovel, be sure to consider UNIT. You'll find that every UNIT has the power and stamina to "carry the ball" through to victory. Excavators that move fast . . . bite deep and hard. Cranes with plenty of LIFT ability. Exclusive features include Automatic traction brakes . . . Straight line engine mounting . . . One piece cast gear case . . . Disc type clutches . . . and above all, UNIT'S safety-promoting FULL VISION CAB. Rugged . . . well-balanced . . . always dependable in the pinches . . . UNIT will help you reach your profit goal. Available in ½ and ¾ yard excavators . . . 5 and 10 ton cranes . . . Fully convertible to ALL attachments. Write for literature.

UNIT 357
— ½ yard Mobile Trenchoe. Modern, self-propelled excavator. Rides on rubber. Operated by one man. Fully convertible.

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½ and ¾ YD. EXCAVATORS
5 and 10 TON CRANES

6409 WEST BURNHAM STREET
MILWAUKEE 14, WISCONSIN, U. S. A.

NEW, FREE STOODY HARD-FACING GUIDEBOOK

Brings you the pick of HARD-FACING PROCEDURES *from all over the nation!*

HERE'S THE LATEST information on hard-facing wearing equipment. The problems have been solved by *welders*, applications have been proved in actual use—and chosen for the guidebook because *each* is tops for increased life and lower maintenance cost! INVALUABLE to welders, foremen, and operators of all types of wearing equipment!

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COVERS WIDE VARIETY OF INDUSTRIES

The Stoody Guidebook is not limited to a few pieces of equipment nor to one industry. Separate chapters are devoted to coal mining, metal mining, brick and clay operations, cement mills, construction, dredging, etc.

EASY-TO-UNDERSTAND ILLUSTRATIONS

show where and how to apply hard metal for maximum life increase. Procedures are designed to eliminate unnecessary waste of hard metal yet to provide *maximum* protection against wear.

CONDENSED INFORMATION

Each piece of equipment to be hard-faced is treated individually, furnishing correct type of Stoody alloy for maximum life, average amount required per application, hard-facing procedure and benefits derived. Applications are all cross-indexed for ready reference.

LONGER LIFE FROM ALL EQUIPMENT

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It's designed to bring you the latest, most-up-to-date hard-facing methods, proved by equipment operators throughout the nation—IT'S GOOD, IT'S ACCURATE, IT'S COMPLETE!

Please send my FREE guidebook immediately!

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Page 14

CONSTRUCTION

STOODY HARD-FACING GUIDEBOOK

NAME OF PART	TYPE OF ROD AND AMOUNT REQUIRED	HARD-FACING PROCEDURE	BENEFITS OF HARD-FACING	EXPLANATORY DRAWING
	3/16" diameter 28-30 Manganese Electric Tube Borium. AMOUNT OF MATERIAL 5 to 7 lbs. for 2 edges of an 8 foot blade.	Bolt blade to carrying scraper. Adjust machine for 125-150 amps. straight polarity and apply Electric Tube Borium using a weaving motion. Deposits need not exceed 1½" width, nor 1/16" in thickness. Sketch illustrates application.	Carrying blades hard-faced with Electric Tube Borium outlast ordinary blades as much as six to one and maintain sharp cutting edges.	
	diameter Coat-Stoody Self-Har-. AMOUNT OF The average bulldozer end plate will require 1 lb. Coated Stoody Self-Hardening.	NEW END PLATES Place bulldozer tip in flat position and apply 3/16" Coated diameter Stoody Self-Hardening diagonally across outer corner. WORN END PLATES Weld new corner of medium carbon steel to end plate. Reface entire insert and run 2 or 3 stringers along outer edges.	Hard-faced bulldozer tips last up to three times longer than those not protected.	

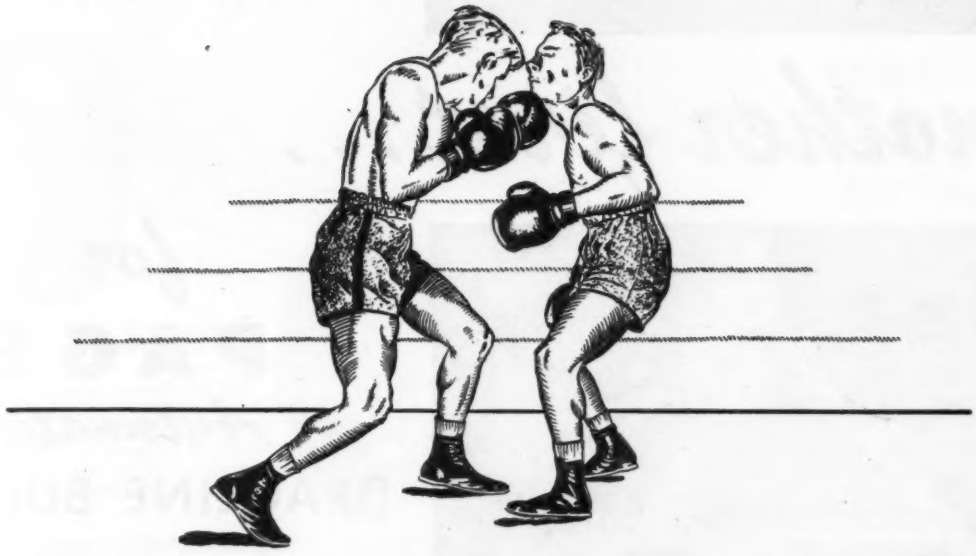
STOODY COMPANY

1129 W. Slauson Ave. Whittier, California

STOODY HARD-FACING ALLOYS

Retard Wear Save Repair

Typical page from the new Stoody Guidebook showing application of Stoody Hard-Facing alloys to construction equipment. Information is short and to the point. Illustrations are clear, easy to understand.



DUAL IMPACT!

...THE ONE-TWO PUNCH OF CHAMPIONS...THE OPERATING PRINCIPLE OF THIS NEW HOLLAND 3030 BREAKER

New Holland Model 3030 in action at Napoleon Limestone Co., Napoleon, Ohio.

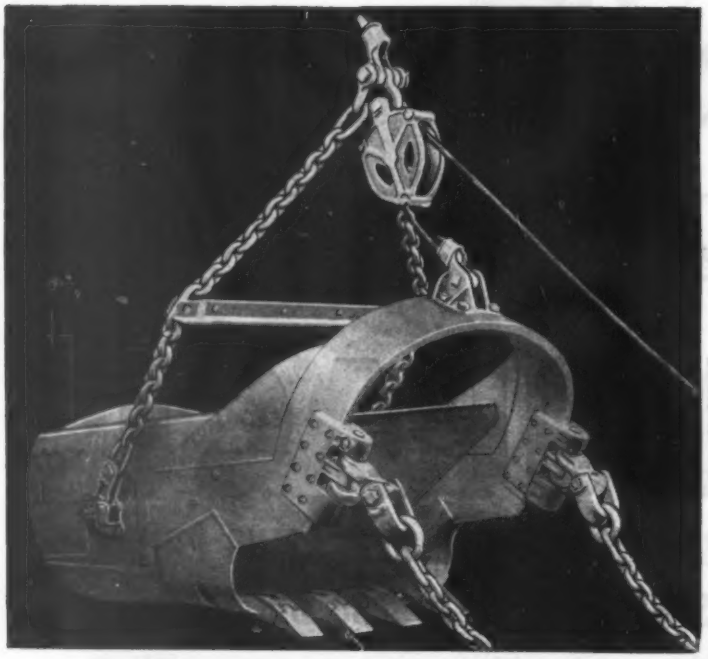
Boxing champions will tell you a good One-Two punch is important. It cuts all comers down to size for the final count. Dual Impact, the One-Two of stone breaking, does the same thing. That's why the New Holland 3030 is champ in its class, too.

Twin impellers give two-fisted action. They cut down 30-inch stones to as much as 80% minus one inch if desired . . . at the rate of 75 to 150 tons per hour. Whirling in opposite directions, these double impellers have greater impact action. And use only 75 to 150 h.p. The New Holland 3030 reduces run-of-the-quarry stone to road ballast or ag-lime . . . excels in "traffic-bound" stone. Fits any conventional closed circuit.

Write Dept. AA-10 for complete details today.

NEW HOLLAND MACHINE COMPANY

Another first . . .



for PAGE *Automatic* DRAGLINE BUCKETS

New and exclusive . . .

PAGE REVERSIBLE CENTER SHANK TOOTH POINTS *(secured by a hook bolt)*

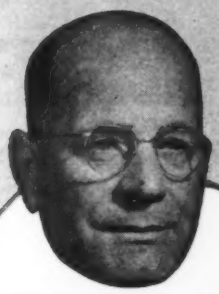
Page Manganese reversible Tooth Points will stay absolutely *tight* on the lip. The new hook bolt fastening prevents wearing and tearing of the bolt and also allows quick and easy detachment of the Tooth Points. Page *Automatic* Buckets are now equipped with these new Tooth Points to insure the best digging in any type of material—a great advancement for the *Automatic*—a great saving for you!

WALKING DRAGLINES • AUTOMATIC BUCKETS

PAGE ENGINEERING COMPANY
CHICAGO 38, ILLINOIS

From the Golden Gate to New England

THESE ST. REGIS FIELD ENGINEERS *are available to the rock products plants of America — day or night.*



R. S. ("Ray") Brown . . . Ray has really been around the country. He joined us in 1925 as a field engineer to cover the Eastern states and parts of Canada. In 1928 he moved to the Pacific Northwest and serviced packers in that area. Later, he established the first St. Regis office in those parts and became its first branch manager. Since 1933 he has been working out of the San Francisco office.

Homer ("Duke") Duggan . . . Since joining us in 1919 as a field mechanic, Duke has been just about every place a cement packer can be found, but the Mid-west is his territory — and he covers it from his Chicago office. For 10 years he supervised packing operations in a large Mid-western cement plant on a contract basis. Duke's vacations are spent hunting and fishing in Kansas.

D. A. ("Dick") Bromm . . . Before joining St. Regis in 1928 Dick was associated with a plaster mill and a construction engineering firm. Now he's an expert on all our packers — and a veteran in packhouses throughout his New York-New England area. When on the road from his Oswego office, Dick likes cards. But don't persuade him to play "pitch" . . . he's deadly.

F. T. ("Fred") Honeyman . . . Years of experience as foreman of a steel fabricating shop which made much of the equipment used in cement plants of that period . . . that's the valuable background Fred brought to St. Regis in 1924. Now, with headquarters in Nazareth, Penna., Fred services packers in the Lehigh Valley area. For relaxation he turns to fishing or a game of pinochle.

H. S. Hangen,
Director

Lehigh Valley Area
G. W. Leopold, Manager
F. T. Honeyman
W. W. Thomas
C. H. Rodgers
J. H. Dively
Eugene Moore

Southern States Area
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G. E. Hunt
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F. H. Loughran
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E. E. Arnold, Manager
H. E. Duggan
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H. J. Zenke
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G. W. Penwell
W. O. Brodine

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D. A. Bromm
H. J. Iselin
John Gans

West Coast Area
D. A. Fleischman, Manager
R. S. Brown
R. M. Crosby
A. S. Wood
R. G. Beasley
H. N. Bullard

EACH of these four "trouble shooters" is a veteran in the packing industry—their combined service in St. Regis' Field Engineering Organization totals 88 years. They and the other 29 members of this staff are familiar figures in rock products plants across the country. Today, their skill keeps more than 2,000 St. Regis Packers in the rock products industry in top working order, so that construction materials may flow without interruption across this nation of builders.

MULTIPLY PROTECTION • MULTIPLY SALEABILITY

ST. REGIS SALES CORPORATION
(Sales Subsidiary of St. Regis Paper Company)

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Vancouver, British Columbia
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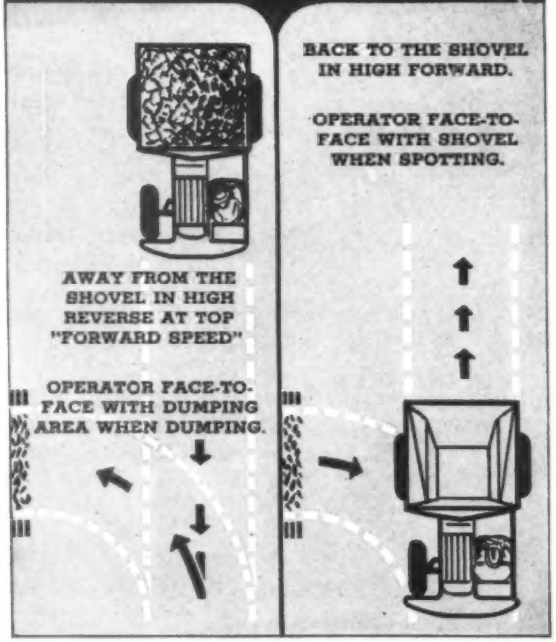
Allentown Birmingham Boston Cleveland Dallas Denver Detroit Franklin, Va.
Los Angeles Nazareth, Pa. No. Kansas City, Mo. New Orleans Ocala, Fla. Seattle Toledo

FORWARD SPEEDS IN REVERSE
ELIMINATE SLOW TURNS IN THE TIGHT SPOTS

HOW DUMPTOR *"SHUTTLE"* RUNS SAVE MONEY ON TURNS . . .


BACK TO THE SHOVEL IN HIGH FORWARD.
OPERATOR FACE-TO-FACE WITH SHOVEL WHEN SPOTTING.
AWAY FROM THE SHOVEL IN HIGH REVERSE AT TOP "FORWARD SPEED"
OPERATOR FACE-TO-FACE WITH DUMPING AREA WHEN DUMPING.

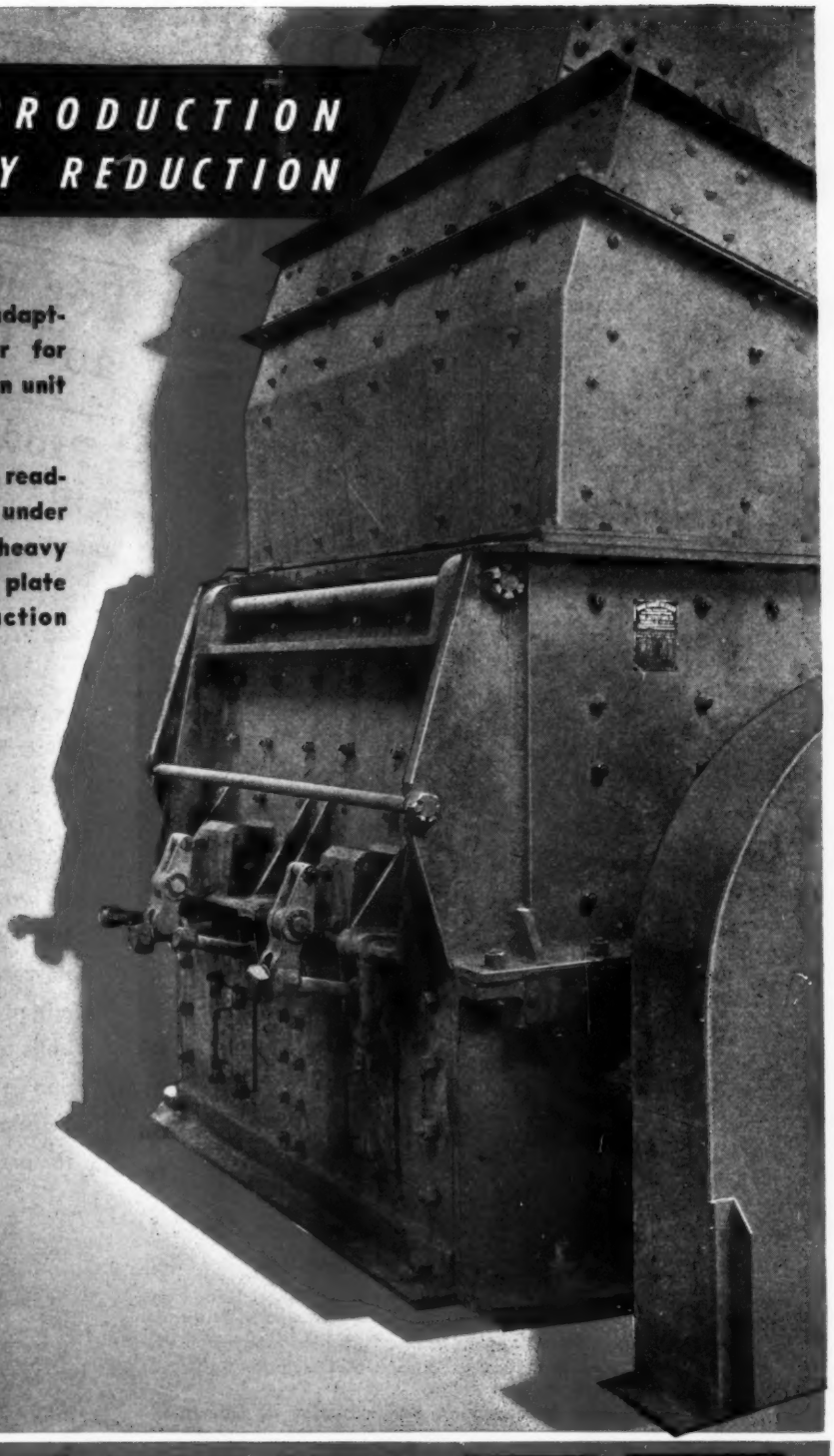
Reverse isn't s-l-o-w with the Dumptor. Three reverse speeds are fast, just as fast as the three forward speeds. Saves time on short "shuttle" runs. High Reverse away from the shovel to grizzly or tipple. Then back to the shovel in High Forward. Two slow turns eliminated. (See diagram). On longer runs, fast reverse means faster backouts, faster turns. Check time for turns on your hauling job, then figure your gains with Dumptors on the job.

KOEHRING COMPANY *Milwaukee 10, Wis.*

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

INCREASE PRODUCTION WITH JEFFREY REDUCTION



Large capacity and great adaptability make this pulverizer for reducing limestone a champion unit in any plant.

Ideal for making Ag stone or readily adjustable for 2" and under or intermediate sizes. A heavy duty pulverizer of armor plate and welded steel construction throughout.

JEFFREY
HAMMERMILL
42" x 66"
Type B

Send For
Catalog 710-A

THE JEFFREY MANUFACTURING COMPANY

935-99 North Fourth St., Columbus Ohio

ESTABLISHED 1877

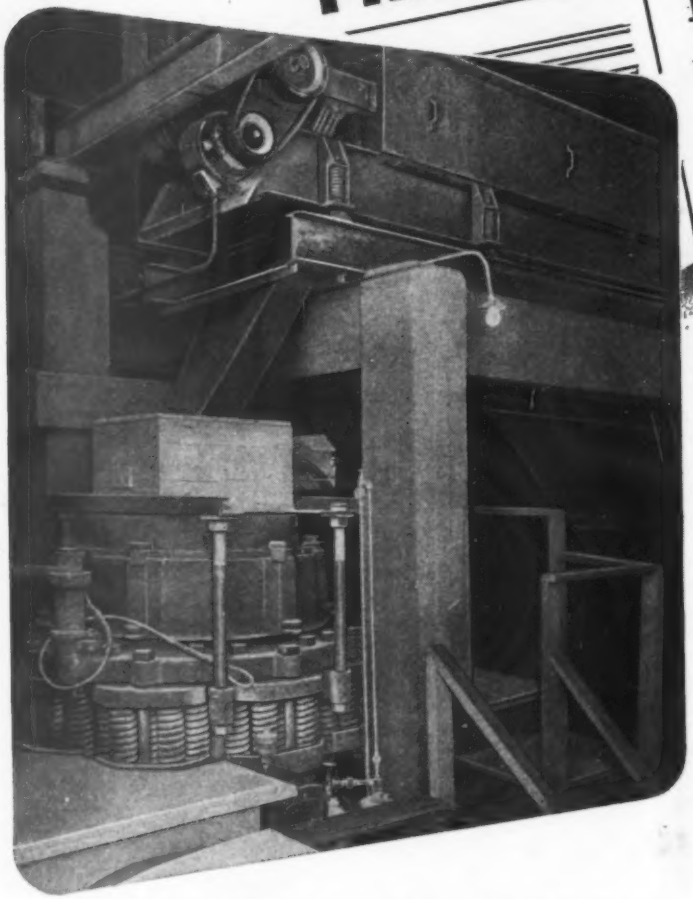
Baltimore 1 Buffalo 2 Cleveland 13 Marion Milwaukee 11 Pittsburgh 22
Birmingham 3 Chicago 1 Denver 2 Houston 5 New York 7 St. Louis 3
Boston 16 Cincinnati 2 Detroit 31 Huntington 19 Philadelphia 3 Scranton 9 Salt Lake City 1

NORDBERG PRO

CEMENT INDUSTRY ADOPTS FINER CRUSHING

For Raw Material and Clinker Stages

Production Costs Cut in Mexican Cement Mills



This Illustration in the mill of Cementos Mexicanos S. A., Monterrey, Mexico is one of two such installations of a 3 foot Symons Short Head Cone Crusher and a 42" x 12' Symons Screen. By delivering a feed of minus 3/8 inch instead of 1¼ to 1½ inch to the raw grinding mills as was formerly done, mill output was materially increased without any increase in power consumption. The finer feed permitted the removal of the larger grinding balls and resulted in an appreciable reduction in mill maintenance costs. A four foot Standard Cone is also installed in this plant for preliminary crushing.

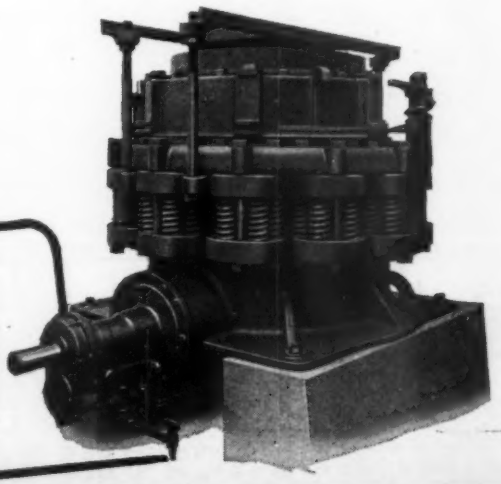
Other recent Symons Cone Crusher Orders for Mexico's cement industry include:

Two 4¼ foot Standards and two 4 foot Short Heads on raw material at La Tolteca Cia De Cemento Portland.

One 4 foot Short Head on clinker at Cementos de Mixcoac.

One 3 foot Standard on clinker at Cementos Portland del Bajio, S. A.

One 3 foot Standard on raw material at Cementos Moctezuma.



In addition to Cone Crushers and Screens, Nordberg also supplies Jaw and Gyratory Crushers, Grinding Mills, Kilns, Coolers, Diesel Engines and other machinery to the cement industry.

NORDBERG MFG. CO.
MILWAUKEE 7, WISCONSIN

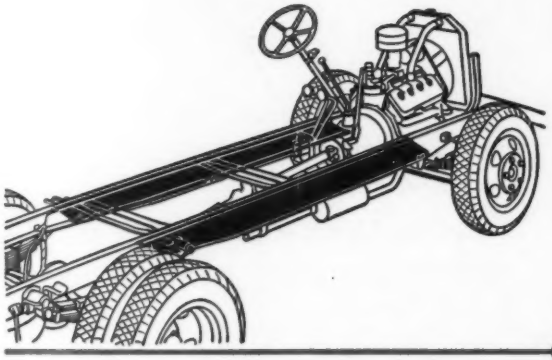
NEW YORK · SAN FRANCISCO · WASHINGTON · LONDON · TORONTO · JOHANNESBURG

SYMONS CONE CRUSHERS

REGISTRATIONS *SHOW* IT — OPERATORS *KNOW* IT!

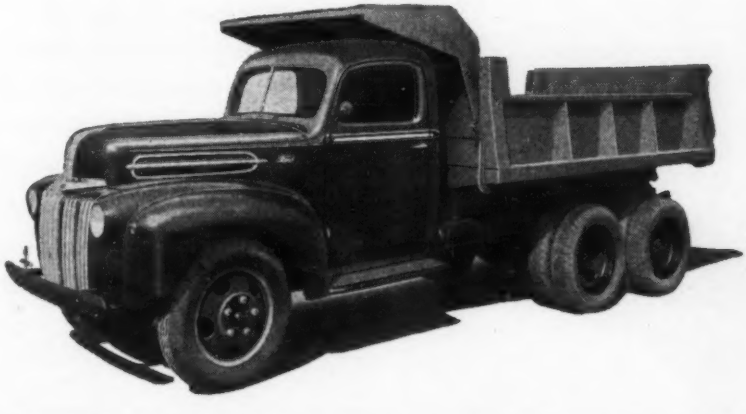
"FORD TRUCKS LAST LONGER!"

One big reason—
FORD FRAMES STAND UP!



One of the big reasons why 78 per cent of all Ford V-8 Trucks ever built are still in use, is found in Ford frame engineering. Ford Light Duty Half-Ton units, for instance, have true *truck* frames—parallel side-rails—full SAE 34-inch width, taking standard bodies—rear kick-up and side-mounted springs for extra-low load height—alligator jaw cross-member—great strength and rigidity, for longer life to cab and body. The full-channel side-rails of Heavy Duty frames are *doubled* between springs, as illustrated, increasing side-rail strength 46 per cent—a construction far superior to old-fashioned fishplates.

Ford



Ford 134-inch wheelbase Heavy Duty Truck, with Thornton drive and 4-6 cubic yard Dump body by Anthony Co., Streator, Ill.

Only Ford offers all these long-life features: choice of 2 great engines, the 100-H.P. V-8 or the 90-H.P. Six—Flightlight aluminum alloy, 4-ring pistons—short, rigid, fully counter-balanced cast alloy steel crankshaft—big brakes, with non-warping, score-resistant cast drum surfaces—extra heavy sheet steel in fenders, hood, cowl and cab—4-pinion differential with triple roller bearing, straddle-mounted axle drive pinion.

There are *more than fifty* such examples of Ford endurance-engineering in today's Ford Truck. NO OTHER TRUCK BRINGS YOU ALL THESE IMPORTANT EXTRA VALUES AT ANY PRICE. Each one adds to the years of faithful service you can confidently expect from your Ford Truck. Let your Ford Dealer point them out to you.

FORD TRUCKS

MORE FORD TRUCKS IN USE TODAY THAN ANY OTHER MAKE

Wherever the Job Takes You

You'll Save with a Gardner-Denver

ALL WATER-COOLED PORTABLE!

There are two things you look for in a Portable Compressor—*continuous service* and *low operating costs.*

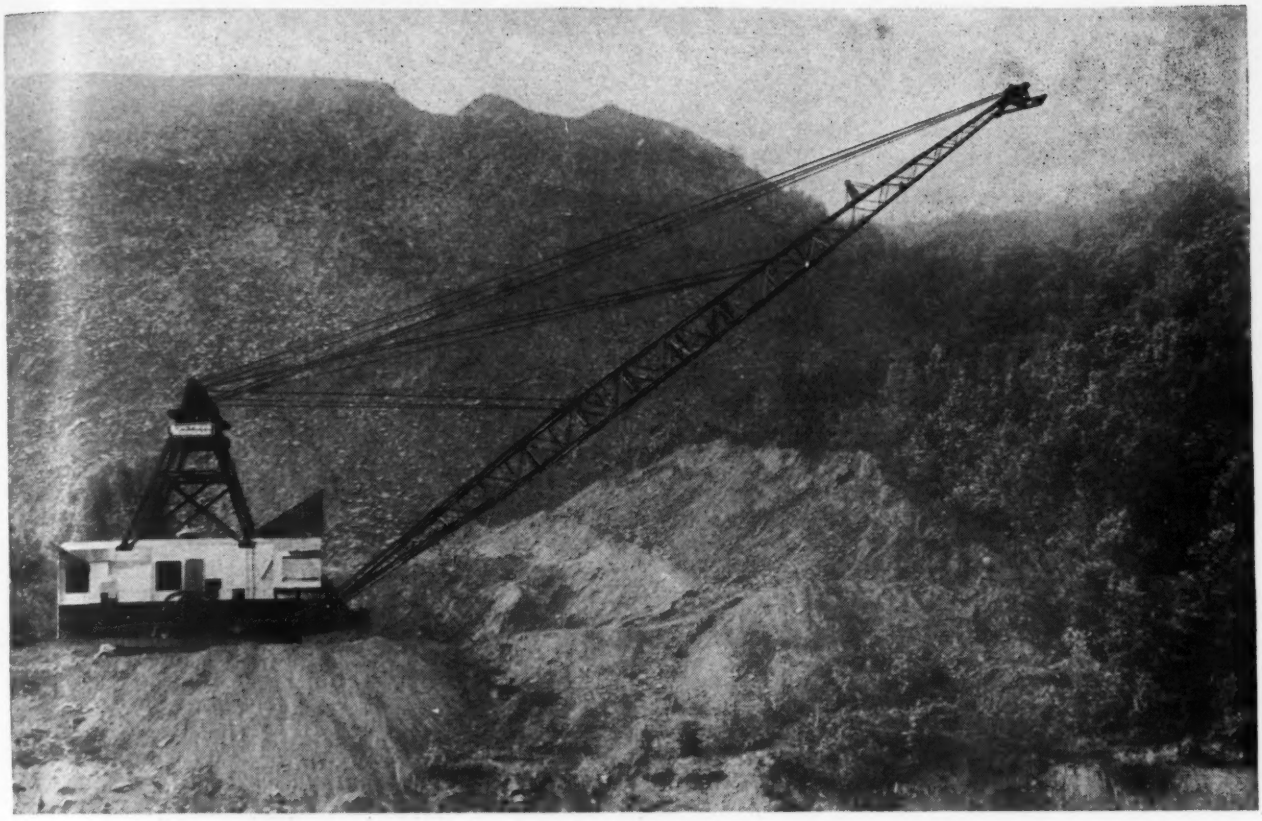
You are SURE of getting both if you insist on having a Gardner-Denver All Water-Cooled Portable.

Because the cylinders of Gardner-Denver Portables are *completely* water-jacketed, these compressors will operate efficiently and continuously wherever the job takes you—in winter or summer—at high altitudes or low. And you'll get that service with low operating costs and a minimum of maintenance.

For all the facts about Gardner-Denver All Water-Cooled Portables, ask any owner —or write Gardner-Denver Company, Quincy, Illinois.

GARDNER-DENVER

Since 1859



THERE'S NO LIMIT ON SIZE

Size, alone, doesn't matter! C. I. T. finances purchases of almost every type of construction equipment . . . and whether the amount involved be large or small, the funds can be obtained quickly and AT LOW COST.

Contractors acquire new and used equipment by making only moderate initial investments. Working funds are left free for tax payments, supplies, pay rolls and other expenses. Terms are arranged which permit equipment to help pay for itself out of earning capacity.

Select the equipment you require . . . tell us what you want to buy . . . how you wish to pay for it. As quickly as delivery can be obtained, a C. I. T. check completes the transaction. Any of these offices will gladly arrange all details for you promptly.

Send for a booklet explaining this construction equipment financing plan.

ONE PARK AVENUE, NEW YORK

333 N. Michigan Avenue
CHICAGO

223 Peachtree Street
ATLANTA

C.I.T. CORPORATION
INDUSTRIAL FINANCING

660 Market Street
SAN FRANCISCO

416 West 8th Street
LOS ANGELES

In Canada: CANADIAN ACCEPTANCE CORPORATION LIMITED,
Metropolitan Building, Toronto, Canada

Generally Speaking

October 1, 1946

Dear Readers:

According to the National Lime Association, excellent results with "DDT-whitewash" compositions have been reported from the Ohio State Research Foundation, in contradiction to earlier reports that lime inactivates DDT. Alleged decomposition of DDT in combination with lime is apparently due to heavy metal impurities and bright sunlight, deterrent factors that can be circumvented according to tests run.

* * * * * * * * * * *

Shortages are having the effect of acquainting consumers with many products, even within the rock products industry. Many builders, now unable to secure gypsum, are using lime plasters for the first time. The lime industry has a real opportunity to promote its product in stucco and in mortars, now that concrete masonry is being used in record quantity.

* * * * * * * * * * *

One of the real tragedies to all the delays in getting highway construction going is that new designs for roads definitely will save human lives. Separated traffic lanes, grade separations, provision for off-the-road parking in event of emergency and other features under consideration actually showed that traffic accidents were cut 76 percent, according to an accident survey conducted in New Jersey.

* * * * * * * * * * *

We are in the midst of an all-out building drive to complete the maximum number of homes now to the extent that non-housing construction approvals are to be cut by 25 or 30 percent.

* * * * * * * * * * *

New York's trucking and shipping strikes had sharp repercussion on construction and the veterans' housing program. Big suppliers of aggregates and ready-mixed concrete, like Colonial Sand and Stone Co., halted deliveries to projects like the huge Idlewild airport.

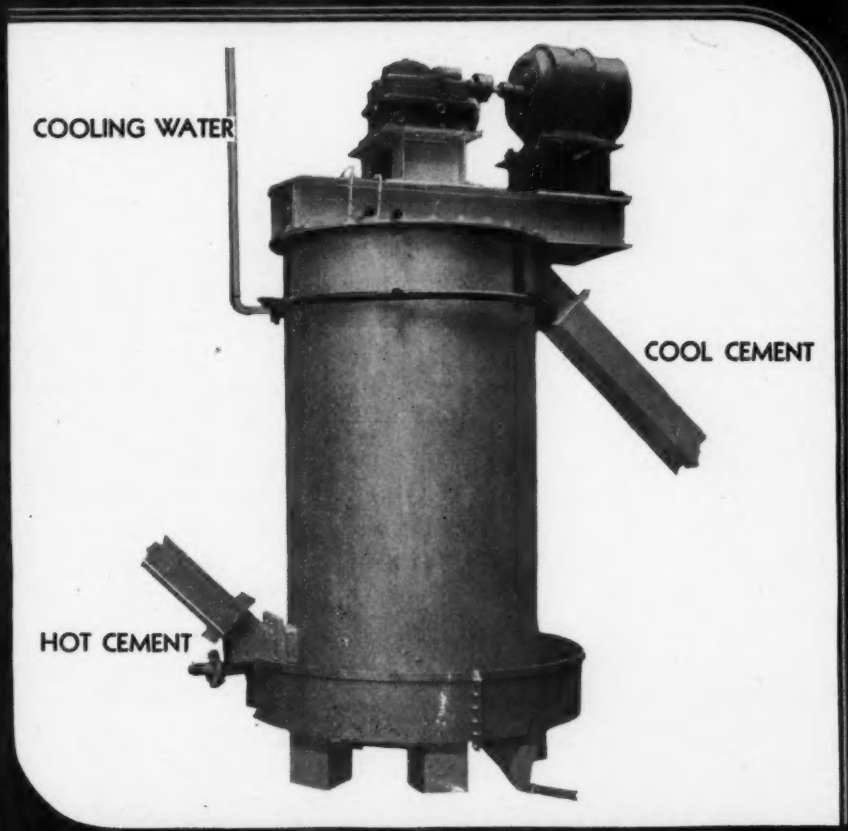
* * * * * * * * * * *

A new collective-bargaining election cannot always be obtained in a plant by challenging the majority status of the bargaining union at the time a contract expires, according to a NLRB recent refusal to put to a new election its one-year old certification of a union.

* * * * * * * * * * *

(Continued on page 43)

FOR COOLING HOT CEMENT



Cement manufacturers are frequently confronted with the problem of cooling hot cement to temperatures acceptable when making bulk shipments or for immediate packing in paper bags. The FLS Cement Cooler was especially developed for cooling hot cement. • The FLS Cooler consists of a tank, water-cooled externally, the cement being introduced into the bottom and conveyed in a thin layer along the inside of the water-cooled wall to the top, where it is discharged. Thus an intimate contact is established between the cement and the water-cooled surface, assuring high-cooling efficiency. • In addition to cement, the Cooler is applicable to many other similar *dry* pulverized materials.

F. L. SMIDTH & CO.

Designers of Cement Making Factories, Manufacturers of Machinery for Making Cement and Lime, etc.

11 WEST 42nd STREET NEW YORK, N. Y.

Meeting Steel Requirements

the Hard Way—

But Still Meeting Them!

A manufacturer of coal mining drills was desperate for 2½" x 2½" x ¼" square tubing needed for drill supports, on an order scheduled for shipment halfway around the world. The required size of tubing was nowhere available, but Ryerson Steel Service was equal to the occasion.

By forming two channels from ¼" plate and welding the channels together we were able to deliver several hundred pieces of the required tubing! While such an emergency measure is obviously not always practical, it did make it possible for the customer to complete his order and ship on schedule. And this is but one of numerous instances where Ryerson service has achieved the seemingly unachievable.

There are many requirements that we cannot handle today, but it is often surprising what can be done with the close cooperation of your nearby Ryerson plant. If needed steel is out of stock the Ryerson salesman will sometimes be able to suggest a practical alternate steel, or he may know a way in which flame cutting, forming or welding can serve to provide a workable substitute.

So we urge you to keep in touch with us. Our whole organization is doing everything within its power to help every customer get the steel he needs.

JOSEPH T. RYERSON & SON, Inc., Steel-Service Plants at: Chicago, Milwaukee, Detroit, St. Louis, Cincinnati, Cleveland, Pittsburgh, Philadelphia, Buffalo, New York, Boston

RYERSON STEEL

(Continued from page 40)

The question of whether the portland cement industry's rated capacity of 250,000,000 bbl. a year can actually be reached is up for discussion now that the CPA estimates requirements for 218,000,000 bbl. in 1947. CPA hopes to encourage slight expansion of existing plants but the industry isn't convinced of the necessity. The prevailing shortage is expected to be short-lived and only mildly bothersome, CPA is planning to place cement on the list as eligible for CC "bottle-breaking" ratings--on a regional basis.

* * * * * * * * * * *

New synthetic resin combinations are under investigation and with increasingly improved results for binders and fillers to increase the strength of plaster of Paris.

* * * * * * * * * * *

Concrete masonry really is front page news, having rated the equivalent of two full columns on the front page of Wall Street Journal, August 26 issue. The industry is credited with being one that has exceeded the Wyatt goal for production--an 800 million unit challenge. It is recommended reading for anyone interested in the industry, for the article discusses production generally, the influx of new plants, utility of concrete masonry and cites interesting production figures of the larger operations.

* * * * * * * * * * *

According to Housing Expediter Wyatt, the incentive payments for the manufacture of gypsum liner in excess of quotas is having the desired results. Enough additional gypsum board and lath for more than 18,000 veterans' homes was produced from this extra liner in July.

* * * * * * * * * * *

All the newcomers to the concrete masonry industry and the many established manufacturers who must return to greater quality standards are urged to study the current series of advertisements now being run in ROCK PRODUCTS. Quoted statements by Jay Ehle in the P.C.A. ad, September issue, and by Philip Paolella, to appear in our November issue, disclose how quality standards are being maintained above all else in their business policies. Those policies have paid off in building a volume of business approaching ten million units this year for each.

* * * * * * * * * * *

Volume of new construction in June, 1946, stood at 125 percent above the level for June, 1945. Public construction, reflecting seasonal activity, increased 30 percent through that period.

* * * * * * * * * * *

Industrial production recovered sharply in June to a new postwar peak. The Federal Reserve Board's seasonally adjusted index climbed 11 points from 159 in May to 170 in June, resulting largely from the rapid recovery in coal and steel production following settlement of the coal strike and considerably due to increases in production of building materials.

* * * * * * * * * * *

A gigantic peacetime purchasing mission by the federal government, to build a stock of strategic materials, is taking shape rapidly--the project being one of insurance against the future possibility that we may be cut off from world markets. The Bureau of Mines and the Geological Survey will have a virtual free hand in the prospecting. Celestite, corundum, mica, quartz crystals and steatite talc are among the non-metallics to be affected.

THE EDITORS

PAGE FROM A BLASTER'S NOTEBOOK

USE PRIMACORD TO SPEED UP OPERATIONS ALL ALONG THE LINE

Interested in cutting the time spent in loading, hooking-up, checking? Then Primacord's your answer. For Primacord lets you plan on shooting more holes with more effectiveness at one shot. It reduces *Loading Time* — you simply lace and lower the bottom cartridge, complete the load, stem and tamp; also *Hooking-up Time* — connections are made with easily tied square knots and half-hitches; also *Checking Time* — trunk and branch-line hook-ups are always in plain sight, easily examined.

What's more, Primacord means less hazard on the job. It is not sensitive to stray currents — it requires no cap in the hole, needs only one cap at the end of the main line — attached when all is ready for the shot.

P-23

PRIMACORD • BICKFORD
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THE ENSIGN-BICKFORD COMPANY
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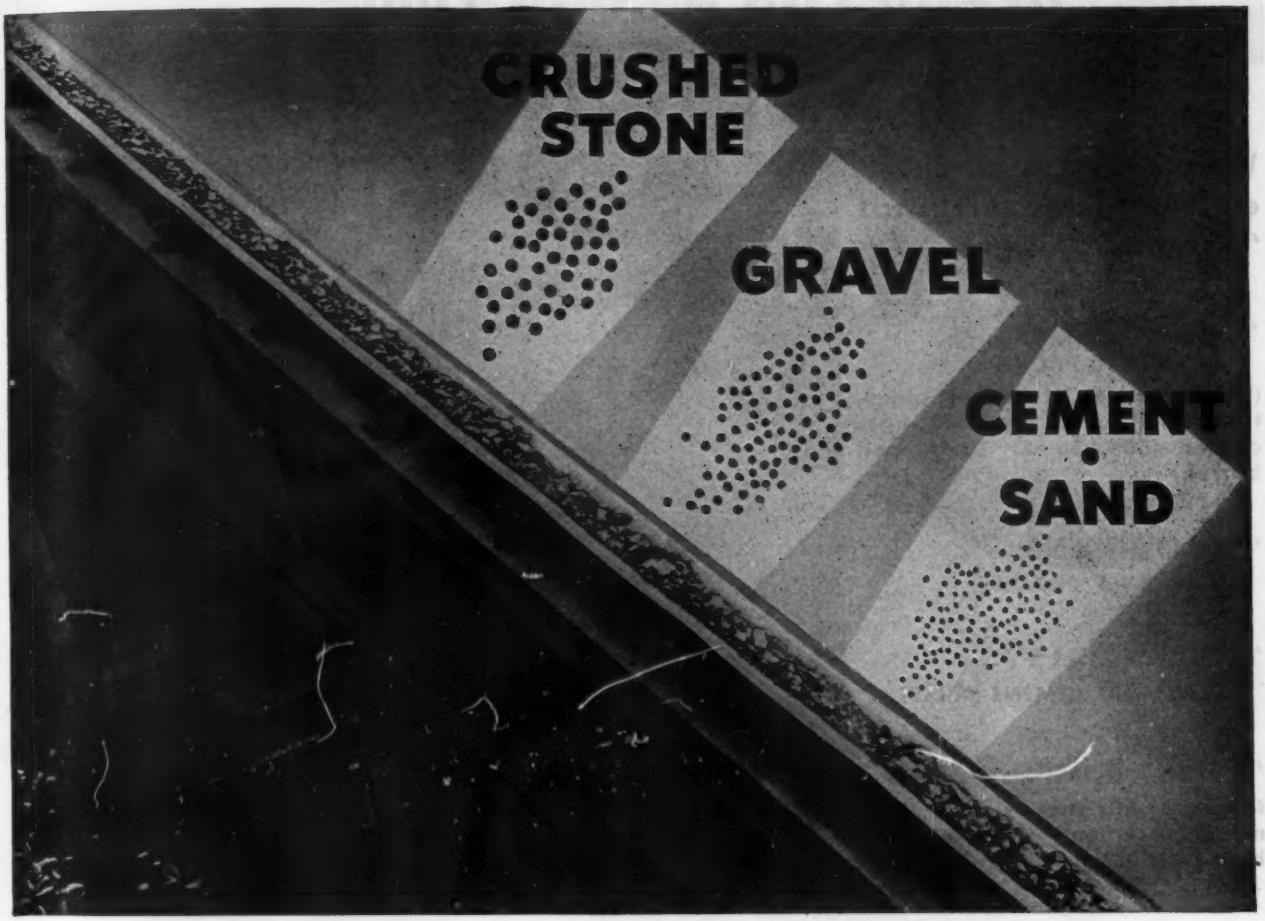

BIG CHUNKS—little chunks—fine screenings—coarse screenings—it's all in a day's work for a Quaker Conveyor Belt.

Quarries, sand and gravel pits, crushed stone plants and operations in kindred industry can have their commodities handled economically and swiftly, too, when they put Quaker belts in use.

Quaker Belts are manufactured of American-made rubber for the cover and friction; the carcass is of high grade, specially selected duck. They are turned out under the supervision of highly trained, technical rubber workers, experienced in producing quality belts.

Quaker Conveyor Belts are what you need to deliver big tonnage, economically.

Then, too, Quaker manufactures a complete line of Industrial Rubber Products that are used so extensively in and around quarries and pits: Belting, both transmission and conveyor; Hose, for air, water, suction, fire protection, paint spray, steam, etc.; Rod and Sheet Packings, Gaskets; Pump Valves, etc.

It is good policy to keep on asking for Quaker Products. Purchase through your local Mill Supply Distributor.

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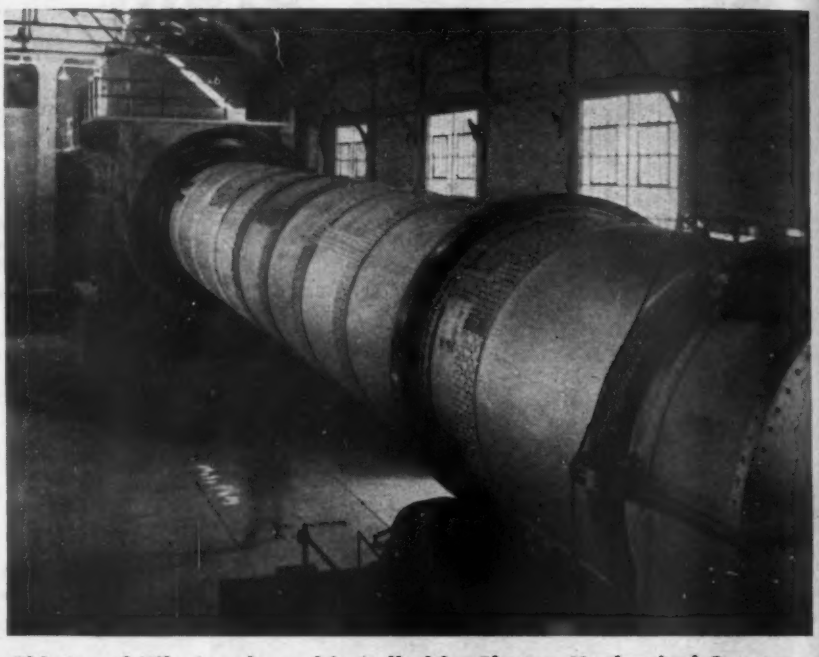
"CERA" PUMPS
for pneumatic conveying of (raw meal or cement) (10-120 tons/hour.)



This Lepol Kiln (made and installed by Electro-Mechanical Construction Co.) produces 275 tons (1463 barrels) of cement daily and has an extremely high fuel efficiency record.

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for simultaneous drying and grinding of raw material (5-50 tons per hour).

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TROUGH CONVEYORS, RAW MEAL MIXING AND HOMOGENIZATION INSTALLATIONS.

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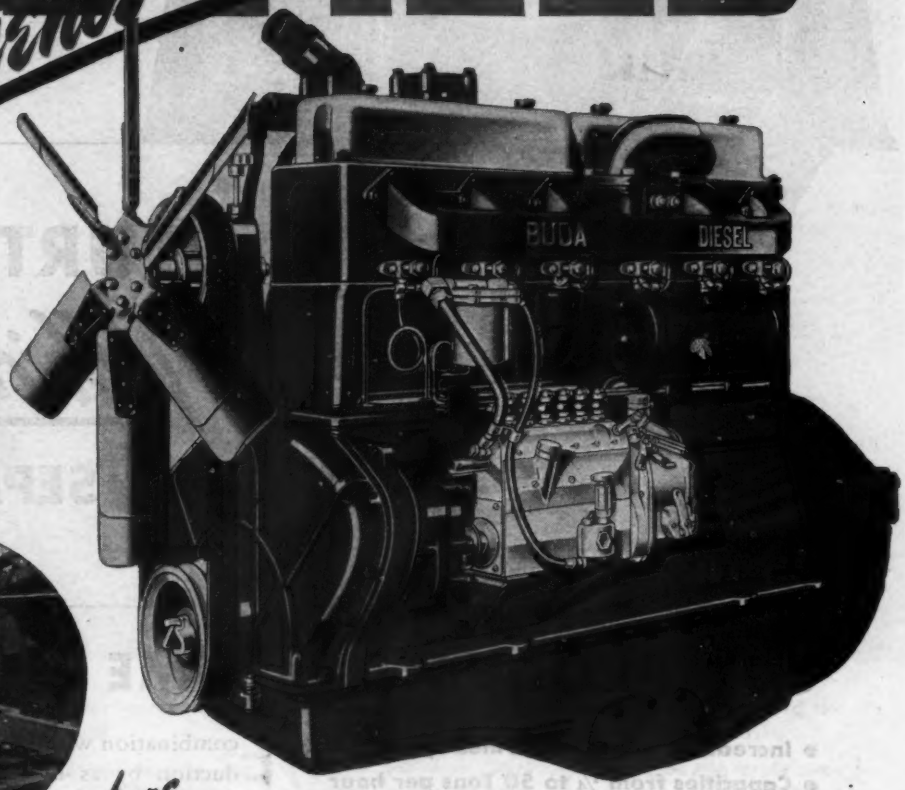

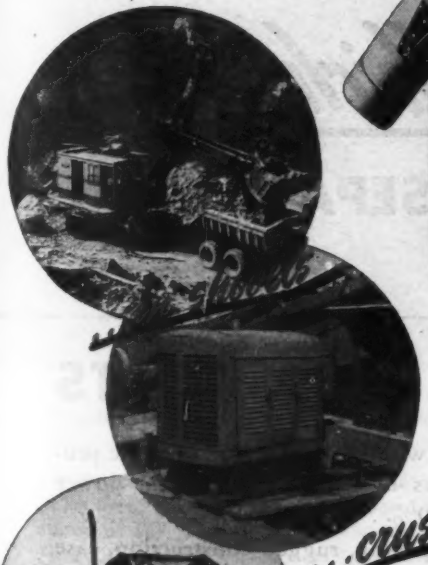

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- **Increase production of Fines up to 300%**
- **Capacities from ¼ to 50 Tons per hour**
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Large or small plants can increase output of accurately sized dry materials and cust costs, too, with Sturtevant Whirlwind Air Separators.

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Large feed opening, rugged construction, ease of adjustment, low power consumption assure economy of operation and minimum upkeep. Write for Bulletin 087 today.

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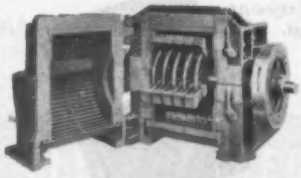

SWING-SLEDGE MILLS for coarse and medium reduction (1" to 20 mesh.) Open door accessibility. Soft, moderately hard, tough or fibrous substances. Built in several types and many sizes.

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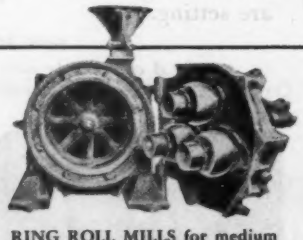
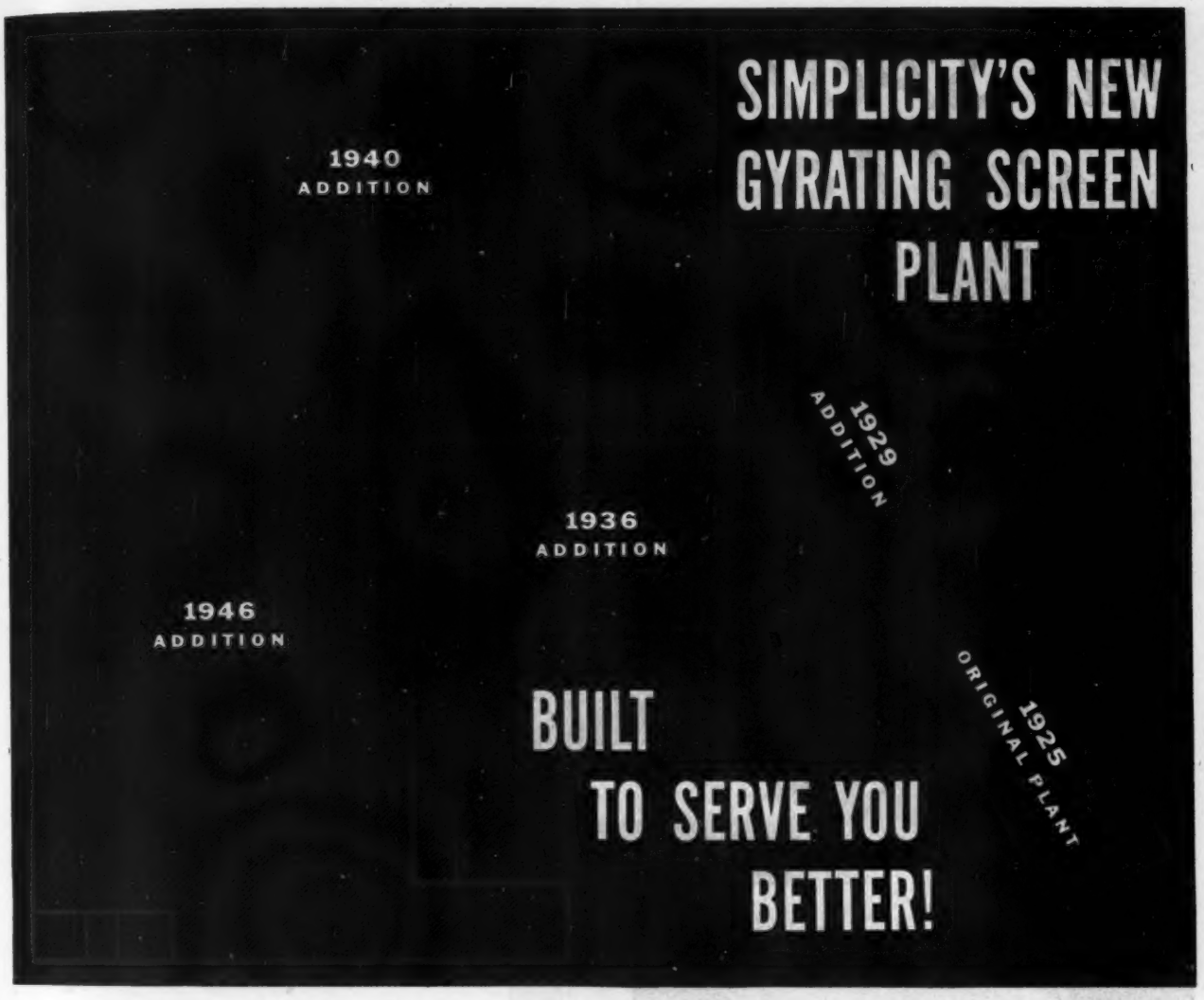


RING ROLL MILLS for medium and fine reduction (10 to 200 mesh) hard or soft materials. Operate in closed circuit with Screen or Air Separator. Open door accessibility. No scrapers, plows, or shields.

MOTO-VIBRO SCREENS screen anything screenable. Classified vibrations. Unit construction—any capacity. Open door accessibility. Open and closed models with or without feeders. Many types and sizes—½" to 60 mesh.



This is a floor plan of the plant your purchases of Simplicity Gyrating Screens have built.

With the new addition (completed this month) our Simplicity plant now has more than 16 times the floor area of the plant built in 1925, and double the floor area of the plant before its latest enlargement.

This August, 1946, addition includes a $38.000 electric oven so that we may stress relieve all welded parts of your new Simplicity Screens without adding one day to the production time. Major welded parts have been stress relieved for several years (to give added life and rugged performance to each screen), but this is the first time we have used our own oven and the first time it has not meant delay in processing.

Thanks for your Simplicity Screen buying preference which makes possible this modern, highly-equipped Simplicity Plant.

We pledge to produce, even better and even faster, the Simplicity Gyrating Screen which is the most widely-used, preferred separation equipment for modern aggregates plants throughout the world.

Write for details about the Simplicity Gyrating Screen with its newest engineering and structural improvements.

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ENGINEERING COMPANY

DURAND, MICHIGAN

The SPOTLIGHT is still Focused on SMITH-MOBILE!

Check these PLUS VALUES:

Dual water system, heated for winter operation . . . Improved, easy-to-operate chute lifter . . . Rubber mounting for bearings and gear case . . . Quickly accessible clutches . . . Improved sealing door . . . Accurate syphon-type tank . . . complete, streamlined enclosure for greater safety.

Improved, Streamlined Models Now About Ready for Delivery

12 years ago, SMITH-MOBILE made its initial appearance as the industry's first HIGH DISCHARGE truck mixer and agitator. It displaced the old style, horizontal drum "hatch-loaders" and rendered them thoroughly obsolete.

Now — SMITH-MOBILE again increases its acknowledged leadership in the field with a record of achievement unparalleled in the industry. To its many time-tested features: HIGH DISCHARGE . . . CONTROLLED DISCHARGE . . . VISIBLE MIXING . . . FEED CHUTE CHARGING . . . etc., are now added many other important refinements that make for even greater speed, efficiency and safety in operation.

Built and guaranteed by SMITH . . . mixer manufacturers for more than forty-five years . . . SMITH-MOBILE is a thoroughly tried and proven product. At present, of course, the demand for this ultra-modern truck mixer greatly exceeds the supply. Deliveries, however, are being pushed ahead as rapidly as conditions permit. In the meantime, we suggest you write for new SMITH-MOBILE bulletin.

THE T. L. SMITH COMPANY

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THE *Original* HIGH DISCHARGE TRUCK MIXER AND AGITATOR

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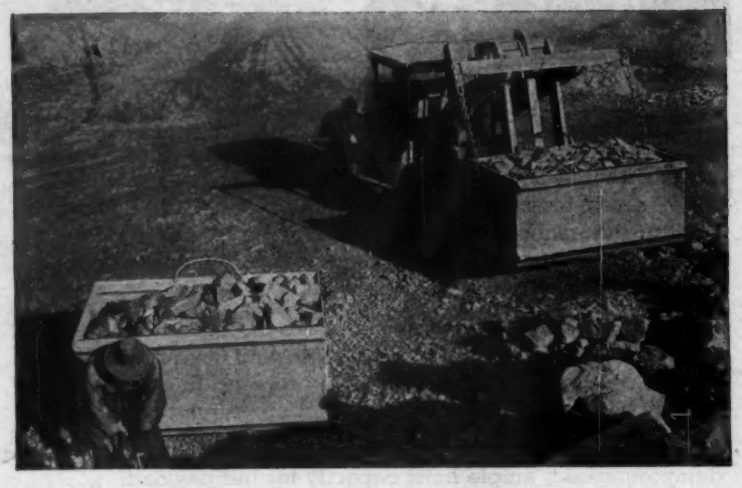

★ The Dempster-Dumpster system of materials handling has been a "life-saver," so to speak, for many quarry, cement, sand, gravel and other industrial plants during recent years. This is easily understood, once you realize the big job the Dempster-Dumpster is capable of.

To see it in operation, no stretch of the imagination is necessary to convince you at once that one truck, equipped with a Dempster-Dumpster Hoisting Unit, will do the same work of 3 to 5 of your present trucks. This one truck is on the go—giving maximum service—in a never ending cycle, hoisting, hauling and dumping one loaded body of material while any required number of other bodies are being loaded. A synchronized system of haulage that saves trucks, tires, gas, time, manpower and money.

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EUCLID *fast-acting* HOIST *Speeds Dumping*

THE three-stage hydraulic hoist of Rear-Dump Euclids saves time and reduces hauling costs. Of Euclid design and manufacture, the powerful hoist and its hydraulic system provide fast, dependable operation and ample capacity for the rated payloads.

Here are some of the features that make the Euclid double-acting hoist unequalled for the heavy duty service of off-the-highway work on construction projects, in open pit mines and quarries, and on industrial operations:

Raises Loaded Body Fast . . . Engine speed controls dumping speed; ample hoist capacity for full payload.

Dumps the Load Clean . . . Hoist has 37" stroke which raises body to 70° from horizontal.

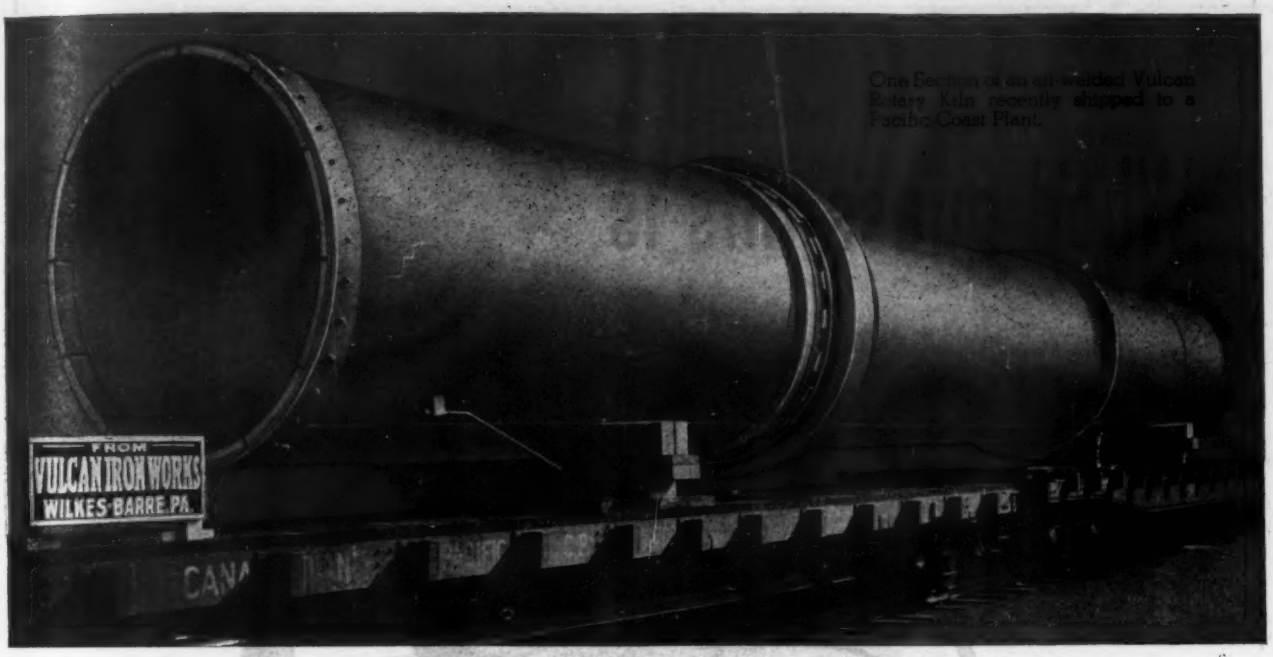
Provides Complete Control of Body . . . Conveniently located hoist valve has four positions: raise, lower, float, and hold. All or part of the load can be dumped according to job requirements.

Lowers Body Quickly . . . Hoist is double-acting in third stage . . . lowers the body under power to the point where it settles quickly by gravity.

Ask your Distributor or Representative to show you how all Euclid models, Rear-Dump and Bottom-Dump, are built throughout for efficient, long life in off-the-highway service.

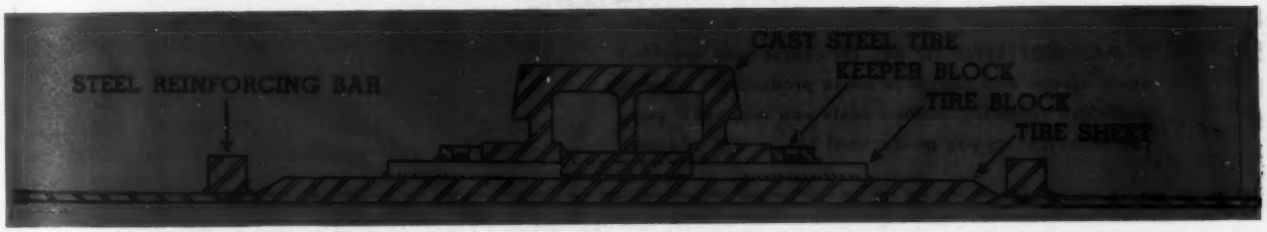
The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

BUILT FOR LOW-COST SERVICE



One Section of an all-welded Vulcan Rotary Kiln recently shipped to a Pacific Coast Plant.

. . . With This Distinctive Rivetless Tire Mounting



The rivetless tire mounting diagrammed above is one important reason why Vulcan Rotary Kilns give good service at low operating cost. Creeping of the tire is permanently prevented by a distinctive combination of interlocking lugs and blocks. And the use of just ONE THICK PLATE beneath the tire, by improving heat conductivity, eliminates burning or bulging of the shell and reinforcing bands at this point.

This cost-cutting feature of Vulcan Rotary Kilns typifies the "economy engineering" made possible by Vulcan's fifty years of continuous experience in the field. Vulcan service also includes the design, construction and equipment of COMPLETE PLANTS for the manufacture of cement, lime and allied products. Write us regarding any manufacturing or processing problems within the scope of the equipment listed below. Constructive suggestions are made without obligation, whenever possible.

Vulcan Iron Works

Cable Address: "Vulworks, Wilkes-Barre." **WILKES-BARRE, PA., U. S. A.** Branch Offices: New York, Chicago, Washington, D. C.

Rotary Kilns, Coolers and Dryers • Rotary Retorts, Calciners, Etc. • Improved Vertical Lime Kilns • Automatic Quick-Lime Hydrators Toothed, Double-Roll Crushers • Steel Castings • Steel Fabrication • Ball, Rod, and Tube Mills • Shaking-Chute and Chain Conveyors Heavy-Duty Electric Hoists • Scraper-Loading Hoists • Cast-Steel Sheaves and Gears • Steam Locomotives • Diesel and Gasoline Locomotives • Diesel-Electric Locomotives • Electric Locomotives and Larrys

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IT MAY NOT SEEM TO BE. **Of course you wouldn't use a screen and shovel in mass production. But any inefficient screening method costs you money! It costs you time! It costs you production! Yes . . . it is a luxury!**

BUT WHEN ROBINS GYREX SCREENS ARE PUT TO WORK—

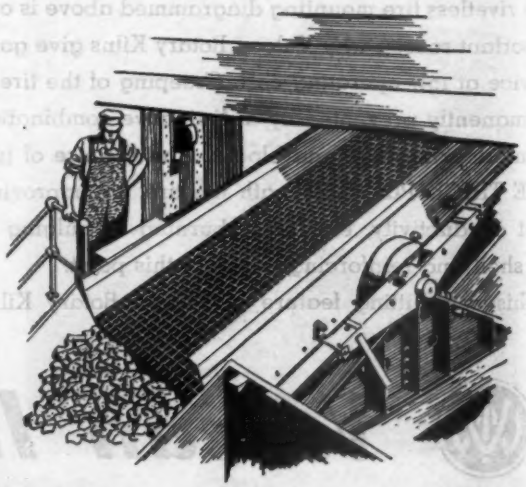
They do your job *cheaper*. They're "Job-Engineered" to screen *your* specific bulk materials . . . help maintain *your* production schedule.

They do your job *faster*. "Circle Throw" action eliminates clogging . . . assures maximum flow.

They do your job *better*. Multiple decks make several sizes in one operation. Screen cloth can be easily changed for new sizing operations.

Yes . . . whatever the problem, you'll find it pays to check with Robins *first!* Ask for the "Job-Engineered" answer to *your* screening problem.

ROBINS
GYREX SCREENS



"Job-Engineered" to Solve Your Problem

CHEAPER . . . FASTER . . . BETTER

Robins Conveyors Incorporated, Passaic, New Jersey—Division of Hewitt-Robins Incorporated

★ ★ Editor's Page

Basing Point Pricing Again Upheld In Court

IN SPITE OF the U. S. Supreme Court's decision in 1925, which upheld the portland cement industry's pricing practices, there has been almost continuous persecution of the industry by the Federal Trade Commission ever since, culminating September 20, 1946, in the most recent of a number of decisions favorable to the industry.

The Federal Trade Commission's Cease and Desist Order of July 17, 1943, outlawing the multiple basing point practice of marketing, has been set aside by the United States Circuit Court of Appeals at Chicago in a strongly-worded opinion that there was no new evidence to sustain charges of conspiracy in the establishment of cement prices.

Before the time of the Roosevelt Administration, the Federal Trade Commission under Chairman Humphries had exonerated the industry, so the revival of the charges in recent years can only be attributable to persistent attempts of new bright young lawyers to reverse the findings of the U. S. Supreme Court itself. Their objective hasn't been attained, at least yet, for the Court was smart enough to see through many fallacies and loopholes in the charges.

Among other significant things, the Court said: "In our judgment, the question as to whether the basing point price system should be declared illegal rests clearly within the legislative domain. We know of no criticism so often and so forcibly directed at courts, particularly Federal courts, as their propensity for usurping the functions of Congress. If this pricing system which Congress has over the years steadfastly refused to declare illegal, although vigorously urged to do so, is now to be outlawed by the courts, it will mark the high tide in judicial usurpation."

F.T.C. Testimony Weak

Evidence presented by the F.T.C. was refuted point by point in the opinion of the Court. It was found "complicated and difficult to comprehend" and to be permeated with uncertain terms and generalities. There was also evidence of tricky double-talk in an attempt to confuse the issue.

In the final analysis, the only point made by the F.T.C. was that the basing point system had continued to be used and the Commission had taken upon itself the responsibility of getting rid of this practice, or any pricing system that results in identical pricing. The portland cement industry appeared the most likely victim because of its direct dealings with public agencies.

Absorption of freight to meet competition—a practice that has led to identical bid prices on many public works lettings—was declared legal. A basing point price system is illegal, according to the Clayton Act, only when phantom freight is involved; i.e., when fictitious (non-producing points) locations are used for the base price.

Basing point prices were construed by the Court as actually creating competition whereas f.o.b. mill prices, the apparent aim of the F.T.C., would have the effect of creating monopolies within the ordinary marketing areas of individual plants.

The Court said, in part: "As we have already shown, the Commission's order proposes to make supreme the advantage of a mill selling in the territory where it has a freight advantage, and to make its disadvantage so great when selling in a competitor's territory as to practically preclude it from entering that market."

The Court further stated: "Under the circumstances shown, we think it is the inevitable result of any pricing system that cement must be sold at the same place at a uniform price whether it be at the point of production or that of destination . . ."

A Waste of Money

It is extremely unfortunate and costly that an industry must continually be compelled to defend itself on old charges. Millions of dollars have been spent by the portland cement industry in its defense—millions that well could have been spent in plant rehabilitation in order that still lower prices, identical prices if you wish, would benefit all purchasers including public agencies.

Hearings by the F.T.C. covered a period of three years and filled over 100,000 pages of testimony and exhibits. At the customary price of 20 cents per page, a copy of the record alone costs a company $20,000, which amounts to about $1,500,000 for the 74 defendant concerns.

That kind of money, multipled many times over to cover all the defense expenditures of the industry, when converted into plant efficiency to save a few cents in manufacturing cost per barrel of cement, could just as well have saved the taxpayer thousands upon thousands of dollars. The taxpayer is going to pay the bill, in one way or another.

The decision has supported marketing methods as old as the modern industry itself but the necessity of having another ruling has added to the colossal waste of time and money that might have been spent constructively.

Bror Nordberg

WANT *AUTOMATIC* DRYING AND GRINDING?

CHECK

the cost-saving features of the

Three B&W Closed-Circuit Systems in an eastern plant grinding 120 tons of limestone and shale per hour—most of it through 200 mesh.

B&W CLOSED-CIRCUIT SYSTEM

Limestone, shale and other raw materials are ground *and* dried automatically and simultaneously *within* the B&W Closed-Circuit System. No separate drying equipment is needed.

Low fuel costs. With the B&W System, fuel consumption for heating drying air is much less than with other methods—as little as 0.3 gal. of oil per ton of material ground.

Gravity discharge in B&W System eliminates sweep. Material from grinding zone is discharged by its own weight. Output is noticeably stepped up, maintenance cut down.

A thoroughly mixed product is assured through substantial circulating load.

The B&W Pulverizer—heart of the B&W Closed-Circuit System—is available in sizes suitable to all capacity requirements.

Call in a B&W engineer and find out more about this modern cost-saving system.

Water-Tube Boilers, for Stationary Power Plants, for Marine Service . . . Water-Cooled Furnaces . . . Superheaters . . . Economizers . . . Air Heaters . . . Pulverized-Coal Equipment . . . Chain-Grate Stokers . . . Oil, Gas and Multifuel Burners . . . Seamless and Welded Tubes and Pipe . . . Refractories . . . Process Equipment.

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
85 LIBERTY STREET, NEW YORK 6, N.Y.

C-68

Washington NEWS

LITTLE more than half the goal of 1,200,000 dwelling units for 1946 had been started in the first seven months of the year. National Housing Administrator Wyatt's report indicates 607,000 dwelling units were started, but reports from the building industry point out that construction progress has been extremely slow due to bottlenecks in the production of materials and labor shortages. Actual completion of jobs started this year will fall far short of the goal as only 287,100 units were finished in the first seven months. To channel more materials into veterans housing, Mr. Wyatt is reported to have proposed a 30 to 50 percent cut in the already reduced volume of non-residential construction.

To further facilitate the housing program, Reconversion Director John Steelman has ordered a 56-day moratorium on new Federal construction. Effective up to October 1, no contract for new construction was awarded. Wherever possible, commencement of approved projects is to be postponed until after April 1, 1947. The suspension order does not apply to contracts already awarded and funds which have been committed for work scheduled to start before October 1. Governmental agencies handling grants-in-aid to States and divisions of government for construction purposes, such as the Public Roads Administration, have been instructed to inquire as to whether States and divisions can bring their own policies into line with the Federal policy. Under a release dated August 27, the Civilian Production Administration advised that no stockpiling of building materials in anticipation of future construction is permitted.

Add Freight Increase To Ready Mix Price

An amendment is to be announced by OPA to MPR-592 which will permit ready mixed concrete producers to add to their ceiling prices the increased cost growing out of increases in freight rates on cement and aggregates imposed by the I.C.C. for interstate rates and by state commissions for intrastate rates, plus the increase of 5 cents in portland cement sold in paper or cloth bags, that increase applying east of, but not including, Montana, Wyoming, Colorado and New Mexico. Executive Secretary V. P. Ahearn of the National Ready Mixed Concrete Association has made a vigorous protest at OPA's failure to give the industry prompt relief.

More OPA Decontrols Announced

As of September 4, OPA announced the exemption and suspension from price control of limestone when sold as cement stone or paper mill stone and as limestone, ground or pulverized, when sold for chemical and industrial uses; slag, commercial blast furnace, for chemical, industrial, constructional and agricultural uses, except slag lightweight aggregates; basic granular refractories, such as dead-burned magnesite and dolomite; silica brick and silica cement.

However, OPA has included a section (9) which provides that any manufacturer who increases his selling prices of the following commodities over the maximum prices in effect on June 29, 1946, shall notify the Building Materials Price Branch, Washington, D. C., of each such change within 10 days after the effective date of this amendment, or the date of the price change: including basic refractory brick; cement retarder rock; fluxing limestone and limestone for use as glass stone; limestone for cement stone or paper mill stone and ground or pulverized limestone when sold for chemical or industrial uses; raw dolomite for refractory uses; silica brick; slag for chemical, industrial, constructional and agricultural uses, except lightweight aggregates; and industrial sands.

Protest Decontrol Discrimination

On September 4, President Richard Coolidge of the National Sand and Gravel Association sent a telegram to Julian Littau, Price Executive, Building Material Branch, OPA, protesting the authorization of OPA to decontrol the slag industry while maintaining maximum prices for sand and gravel. It is agreed that the slag industry is entitled to decontrol, but the protest is voiced at the apparent discrimination in favor of competing industry. It was pointed out that these two industries are competitive in many States and their products find employment in the same markets and for the same purposes. The considerations which prompted decontrol of slag apply with equal validity to sand and gravel.

Pass on Freight Rate Increase

Permission to increase ceiling prices by the percentage amount of the increased acquisition cost resulting from inbound rail freight increases since March 31, 1946, was granted by OPA to resellers of sand, gravel, crushed stone; building, chemical and industrial lime (not agricultural); sand lime brick; and cement.

Cement on CPA Schedule A

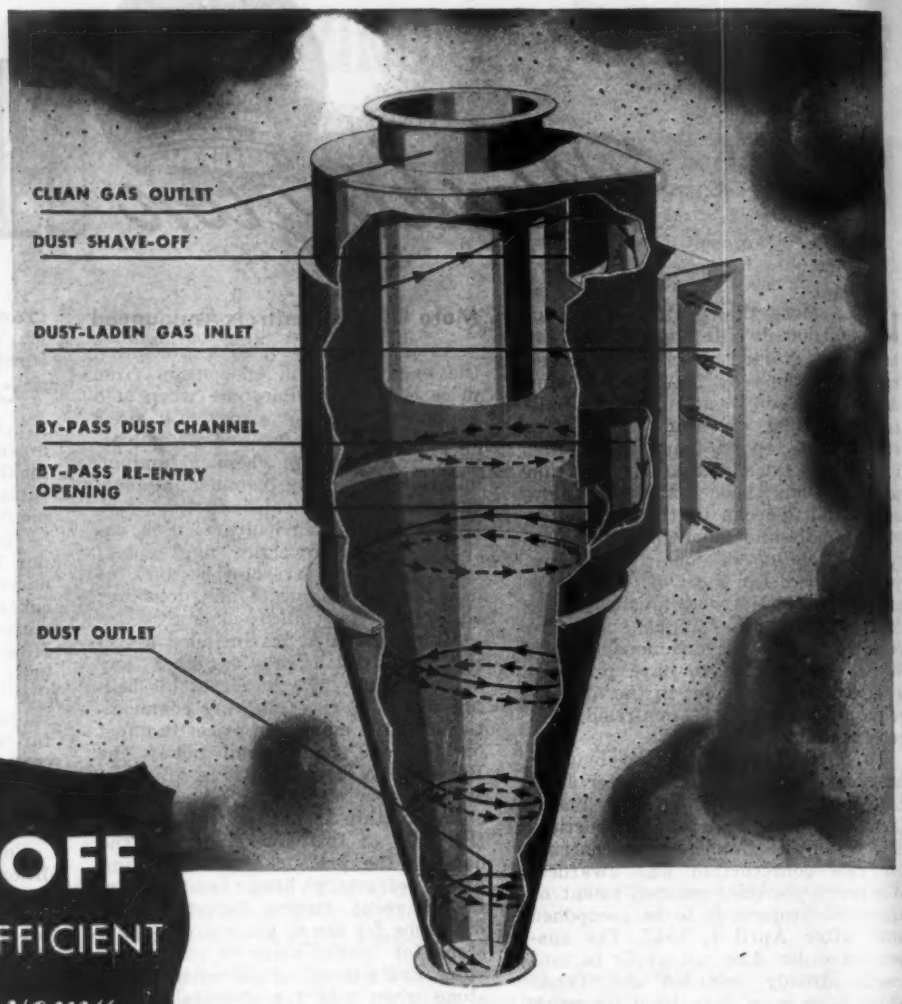
Schedule A to PR-33 has been amended to include portland cement, making it subject to HH and HHH ratings served on distributors of cement as such. These ratings may not be served on cement manufacturers nor on ready mixed concrete producers; therefore the ready mixed concrete industry is unaffected by inclusion of cement on Schedule A. However, if a company is engaged both in ready mixed concrete production and cement distribution, it is subject to Schedule A requirements so far as cement distribution is concerned, but it can continue to use for ready mixed concrete production its normal percentage of cement receipts allocated for that purpose.

For example, if a company has traditionally used 75 percent of its cement receipts for ready mixed concrete production, there is no barrier to its continuing to do so. A distributor need not make more than 75 percent of his deliveries of any item on Schedule A on rated orders in any calendar month. The remaining 25 percent can be used for deliveries on non-rated orders,

A bulletin of the National Ready Mixed Concrete Association reports that CPA and the National Housing Agency are concerned about alleged ready mixed concrete shortages in a few cities. NHA has requested the inclusion of ready mixed concrete on Schedule A, but CPA is unwilling to amend Schedule A to include ready mixed concrete in the belief that the reported ready mixed concrete shortages are really cement shortages.

Agstone Contract Problem

The National Crushed Stone Association, Agricultural Limestone Division, has announced that official approval has been given to the use of an escalator clause in the 1947 contracts for agricultural limestone. This clause provides that an increase in prices to the extent of the applicable rail freight rate increase will be permitted. Henry A. Huschke, managing director of the Division, points out that although the use of this clause has been approved, it lies within the discretionary powers of each State committee to decide whether or not it will be added to the list of "conditions" which is customarily made a part of each bid invitation.



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Buell's book—"The van Tongeren System of Industrial Dust Recovery"—illustrates and explains the patented van Tongeren principle and its many applications to industry. We will be pleased to send you a copy without charge.

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Rocky's NOTES

Nathan C. Rockwood

Near The End Of The Cycle

HAVING UNDERTAKEN to read and review the complete record of labor dispute and arbitration settlements under the Fair Labor Standards Act, the National Labor Relations Act and other federal legislation, I have definite reactions about our industrial outlook. Of course, we have been fairly well informed on important developments by reading the letters to members by V. P. Ahearn, executive secretary, National Sand and Gravel Association, and some of the Washington news letter services, but there are human interest factors in reading the actual proceedings that have been missed.

Now, these proceedings are read and digested, no doubt, by personnel managers and corporation lawyers, but probably few business men in this or any other industry read them thoroughly, or if they do, make any attempt to see the picture they present as a whole. What do all these proceedings, which in the aggregate are costing the citizens of the United States millions, if not billions, of dollars mean? Is there anything of permanent value to come out of them? What effects will all these precedents have on the industrial picture of the future?

The reader may say, why this has been going on for the last 10 years, isn't it about time you took notice of them? Of course, we have taken notice and raised our wee small voice in protest many times in those 10 years. Yet, we confess that in spite of the general knowledge we have had of the changing picture in American industrial relations, we were startled to find how much we have overlooked in not studying the picture more closely. Believing that other readers would get similar reactions, we are going to set some of these down.

Collective Bargaining Results

The first distressing fact we note is that employers have been and now are bargaining away, in union labor contracts, their right to select their own foremen and overseers. No well-meaning employer would hesitate to confirm a policy of rewarding long and loyal service by promotions to more responsible and better-paying jobs—it is a fundamental element in the American way of life. To the uninitiated employer who signs a union contract containing a seniority clause, that is probably what he has in mind. Unless he has read the "awards" of arbitrators in many cases where such contracts have been interpreted, he does not realize that he has probably given labor union officials the power to take away his right to select assistants on his own good judgment of capability as well as seniority.

And the most distressing feature in all this picture is that the ordinary workman is allowing his union officers to bargain away his right to rise in the world of industry. If he, perchance, is ambitious, and desires to show his prowess to his superiors, he will find himself pushed down and cordially disliked by his union. In a nation which has never had any recognized "class distinctions," where men of superior talents were continuously rising from the bottom to top, it appears that every effort is now being made by organized labor to establish strata in society which will have little in common with each other, except citizenship.

The same kind of a situation exists when an employer tries to clean out some of the war-time accumulated dead wood in his organization, or to promote efficiency by weeding out trouble makers. For it is these very same trouble makers for whom the union officials will strive the hardest, with the sympathetic help of the U. S. Labor Department arbitrators, to keep in their jobs. With a little bit of background in reading the record of some of these cases, one can readily understand when automobile manufacturers and others in big industry say that labor efficiency has slumped to about the lowest in American history.

The question naturally arises what will be the outcome of this attitude in American industry? How long can we maintain our world-wide industrial supremacy when it is no longer possible to manage industry with accustomed efficiency? Or, is this merely a temporary trend, and are we as Americans to regain our sanity, and if so when?

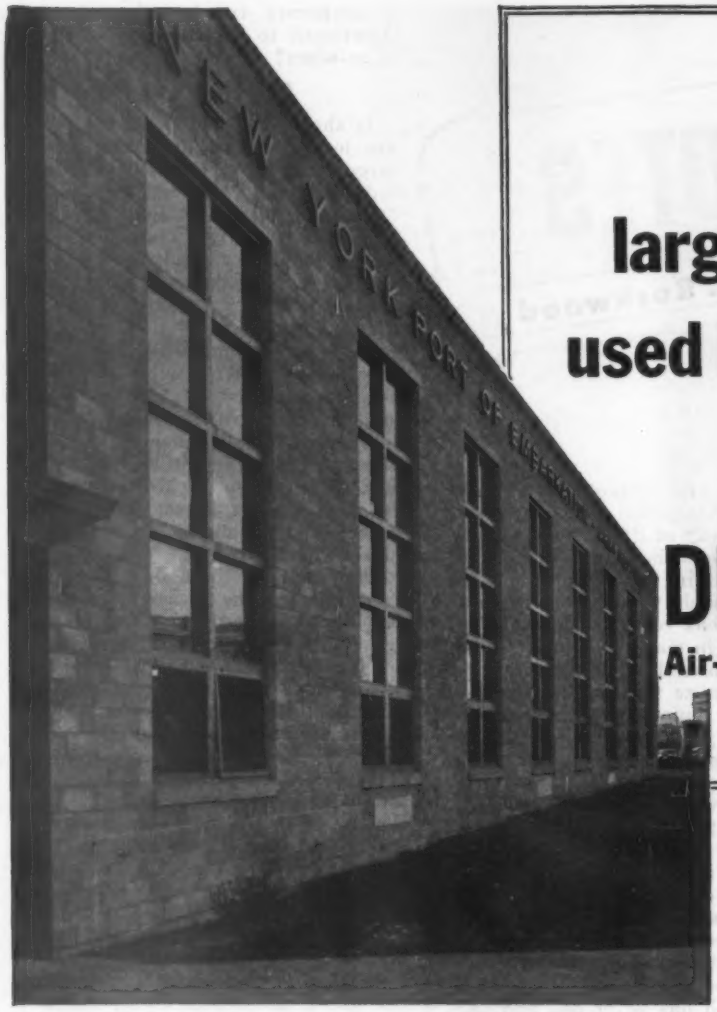
For How Long?

It should be obvious that what we are losing, or perhaps have already largely lost, is our sense of individual independence. Those of us who are 60 years or more have lived through a period in which an individual sense of responsibility and independence reached its climax, and has since degenerated with, apparently, a growing acceleration. We saw the last of the pioneers who went West to open up new resources. We saw the last of the great business barons, who grew rich and powerful with little or no legal restraint. We can remember the days when the boss ran his business as he saw fit, when he picked young men from among his lowest workers and took pride in building their fortunes along with his own.

They tell us those days are gone forever; that the pioneers were robber barons; that their industries were not really theirs, but belonged to the public, to society. They say no man should have the economic power they had over their employes, over society; that the right to hire and fire and to build up an efficient and successful business enterprise must no longer be entrusted to men of enterprise. Yet, American industry and business, as we know them, are the fruits of such enterprise.

According to the laws of nature, action and reaction are equal and opposite, whether this applies to physical and chemical forces, or to physiological and psychological forces. When the pendulum swings to the right it must swing back again to the left. American psychology swung to the right from 1880 to 1930; it is now swinging to the left. Has it reached the top of the swing or must we wait another 50 years for the end of the cycle?

What is not good for society as a whole is never durable, measured in the life of a nation. From an era when the function of government was to keep hands off private enterprise and private initiative, we have arrived in an era when the rank and file of individuals no longer want individual responsibility; when they are getting to believe that if only the government will supply money, all other things can be had. We are due for a rough awakening; we are to learn again the biblical truth that man must live by the sweat of his brow, or the fertility of his brain. But when? Probably not until a great many Americans go hungry, and the futility of the left swing has been proved as was that of the right; which is to say, when Mr. Average Man finds out men of enterprise are better judges of latent talent than labor unioneers; that the good things of life are the products of brains and enterprise, and strong backs, and not the results of spending printed money.



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Air-Entraining Portland Cement

Army Post Office, Long Island City, N. Y. Built under direction of Col. Edgar W. Garbisch, U. S. Army District Engineer; Alfred Hopkins and Associates, New York, architects-engineers; John A. Johnson Contracting Corp., Brooklyn, N. Y., contractors; concrete block by National Brick Corporation, Long Island City, N. Y.

Thousands upon thousands of superior concrete block . . . made with Atlas Duraplastic air-entraining cement . . . went into this massive, 14½-acre project.

Contractor said completion was speeded by consistently cleaner edges of block, by truer dimensions, by minimum spoils from handling. Block maker continues enthusiastic use of Atlas Duraplastic because of improved appearance and texture of block, greater density and compactness, fewer culls and throwbacks.

Atlas Duraplastic complies with ASTM and Federal Specifications. It sells at the same price as regular cement. It requires no added expense or unusual changes in block-making methods. Send for further information. Write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

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MAKES SUPERIOR CONCRETE PRODUCTS AT NO EXTRA COST

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel—Sunday Evenings—ABC Network*

the *Personal Side* of the news

Superintendent Resigns

W. H. PATTERSON, superintendent of the Mason City plant of the Lehigh Portland Cement Co., Allentown, Penn., has resigned and will be succeeded by ARNOLD J. JOHNSON, formerly combustion engineer at Allentown. Mr. Patterson has been employed at the Mason City plant for more than 24 years, serving as plant engineer from 1922 to 1934, when he was promoted to succeed Oscar E. Davis, who retired at that time. JOHN T. LYNN, formerly chemist at the Ormrod, Penn., plant, has been appointed assistant superintendent and supervising chemist of that plant. He has been in the employ of the company since 1919.

Partners

SIDNEY H. ELIASON, formerly Pacific Coast district manager of the U. S. Gypsum Co., Chicago, Ill., and W. S. MOLE of Chicago, Ill., have purchased the present American Keene Cement and Plaster Co. plant at Sigurd, Utah. The new concern is to be called the Western Gypsum Company and will produce gypsum lath and wallboard. Mr. Eliason had been employed by the U. S. Gypsum Company for 18 years and had previously held positions as Salt Lake City and Utah manager for the company. He now resides in Los Angeles, Calif.

Heads Lime Company

SAM A. JAMES, formerly with the Southern Aggregates Corp., Raleigh, N. C., is the new president of the Ladd Lime and Stone Co., Cartersville, Ga.

W. E. JOHNSON, also formerly with Southern Aggregates Corp., will be associated with him in the operation of the new, modern crushed stone plant. Mr. Johnson will be vice-president, and William R. Waters will serve as assistant secretary and treasurer of the plant, while his mother, Mrs. Martha R. Waters, is secretary-treasurer of the firm.

Medical Director

DR. C. RICHARD WALMER has been appointed medical director of Industrial Hygiene Foundation at Mellon Institute with the rank of Senior Fellow. For the past five years Dr. Walmer has been associated with Dr. T. Lyle Hazlett, medical director at Westinghouse Electric Corp., serving as toxicologist and as a consulting specialist in industrial medicine.

General Manager

FRANCIS V. J. HAGGERTY has been appointed general manager of the Wilmington Division of Warner Co., Philadelphia, Penn., to fill the vacancy left by the death of Joseph M. Pusey. Mr. Haggerty has been associated with the company since his graduation from the University of Delaware in 1934, except for an interval of five years when he was on active duty with the Army. Upon his return last September he was made sales manager of the Wilmington Division. While in service he saw action on Guadalcanal, Tulagi, Bougainville, and on the Russell, New Georgia and Treasury Islands.

Named Vice-President

ARTHUR C. WILBY, formerly assistant to the president of the Universal Atlas Cement Co., New York, N. Y., and more recently Chicago district manager of public relations, Carnegie-Illinois Steel Corp., has been elected vice-president of the United States Steel Corp. of Delaware. Mr. Wilby has been associated with U. S. Steel Corp. since 1909. Prior to that he was assistant superintendent of the Waterloo Cement Machinery Corp.

Arthur C. Wilby

New Superintendent

JAMES E. JACKSON has been appointed superintendent of the Thornton, Ill., plant of the Marblehead Lime Co., Chicago, Ill., succeeding the late Earl R. Houchins. Prior to becoming superintendent, Mr. Jackson was in charge of plant maintenance.

Named Superintendent

JOHN W. BRADBURY has been appointed superintendent of the Jamesville, N. Y., plant of Alpha Portland Cement Co., Easton, Penn., replacing E. L. Boyne, who has resigned. Mr. Bradbury was formerly assistant superintendent of the Green Bag Cement Co. of Pennsylvania, Pittsburgh, Penn.

Appointed Manager

WILLIAM P. JACKSON, who has been associated with the sand and gravel and ready mixed concrete business for many years, has been named manager of the Glacier Sand and Gravel Co., Seattle, Wash. He was formerly retail operations manager. Previous to serving over three years as an officer in the U. S. Navy, Mr. Jackson was connected with Henry J. Kaiser Company, Oakland, Calif.

Operations Manager

R. E. SANSOM, who has been connected with the American Limestone Company and Watauga Stone Company, Knoxville, Tenn., since 1941, has been promoted to the position of manager of crushed stone operations, with headquarters in Knoxville. Mr. Sansom was engaged in mining operations in Joplin, Mo., after his graduation as a mining engineer from the University of Missouri. From 1937 to 1941 he was with the American Zinc Company of Tennessee at Mascot, Tenn.

Becomes President

CLARENCE E. EHLE, executive vice-president and general manager of the Indiana Limestone Co., Bedford, Ind., has been appointed president of the company, replacing Eugene F. Olsen, who has resigned but will continue as a director. Mr. Ehle is widely known in the industry through his former association with The Cleveland Builders and Supply Co., and as president of the National Concrete Masonry Association.

Clarence E. Ehle

W. H. Chestnut, State Secretary of Labor and Industry, Pennsylvania, and Otho Graves, General Crushed Stone Co., at Pennsylvania Stone Producers' outing

Joins U. of I.

PROF. HORATIO M. FITCH, who for the past eight years has been teaching courses in the subjects of structures, hydraulics, and mechanics at the University of Arizona, has been appointed assistant professor of theoretical and applied mechanics at the University of Illinois, Urbana, Ill. Prof. Fitch was associate editor of ROCK PRODUCTS from 1927 to 1929, when he joined the Rock Island Railroad as assistant engineer. He entered the teaching field as instructor of general engineering drawing at the University of Illinois from 1929 to 1933. He then spent a year as superintendent directing C.C.C. camp work. Then he went to North Dakota State College, where he taught until 1938 when he went to the University of Arizona.

Becomes Director

HERBERT E. HARDING, president of the Glens Falls Portland Cement Co., Glens Falls, N. Y., has been elected a director of the Glens Falls Hotel Corp. to fill the unexpired term of the late Francis P. Moynehan. Mr. Harding has been associated with the Glens Falls Portland Cement Co. since 1939, when he was elected a member of the board of directors. He became president of the company in 1943, following the resignation of H. H. Titsworth.

Personnel Manager

H. BRUCE WILSON has been appointed manager of industrial relations of the Pittsburgh Limestone Corp., Pittsburgh, Penn., a U. S. Steel Corp. subsidiary. HENRY B. BALTZERSEN has been made comptroller and assistant secretary, and Raymond W. Long, assistant comptroller.

Peerless Personnel

W. L. KAISER has been appointed vice-president in charge of manufacturing of the Peerless Cement Corp., Detroit, Mich. A. C. Eichenlaub has been made works manager at the Detroit plant; C. J. Line is chemist; John Sulfridge, general master mechanic; Richard LaBo, chief power engineer; K. G. Howard, chief electrician; K. J. Beebe, general mill foreman of the Detroit plant; R. R. Adams, superintendent, and C. Knapp, general mill foreman, at the Port Huron plant. Other officers of the company are: R. D. Baker, chairman of the board; W. C. Russell, president; M. M. Sepic, secretary and treasurer; H. L. Henson, chief engineer; C. A. Luck, assistant to president; J. W. Stead, assistant secretary and purchasing director; J. J. Dreiling, credit manager; R. J. Morrison, director of personnel; Miss M. E. Mills, assistant treasurer; L. F. Lawler, vice-president and sales manager; G. C. Beld, assistant sales manager; F. N. Steadman, manager paint division; J. C. Dunn, traffic manager; C. H. Rice, traffic service manager, and S. W. Drews, advertising department.

E. A. Weymuth, Pittsburgh Limestone Corporation, and H. H. Wagner, general manager of the Pennsylvania Stone Producers' Association

Alpha Manager

ROBERT LEE MITCHELL has been appointed manager of the St. Louis District of the Alpha Portland Cement Co., Easton, Penn., to succeed E. J. Moors who has retired after many years of service with the company. Mr. Mitchell, an alumnus of Washington University in St. Louis, was formerly associated with the cement company as sales representative and later as special representative from 1935 to 1942. He resigned in 1942 to accept a position as Western manager of the New York Air Brake Company in Chicago, and returned as manager of Alpha Portland Cement Co., St. Louis, Mo., in July, 1946.

Chemist Retires

JOHN G. DREHER, chief chemist at the Hudson plant of the Universal Atlas Cement Co., New York, N. Y., has retired after more than 40 years' service with the company. He will be succeeded by his brother, ROY R. DREHER, who has been his assistant for several years. Mr. Dreher started in the cement industry in 1905, in the laboratory of the Northampton plant of the Atlas Cement Co., which was later taken over by the Universal Atlas Company. When the concern purchased the old Hudson Portland Cement Co., Mr. Dreher with several other employes from Northampton assisted in getting the new plant started.

Assists General Manager

MARION O. KIRP, operating assistant of the alkali division of the Diamond Alkali Co., Painesville, Ohio, has been appointed assistant to the general manager. Previously he was superintendent of the Standard Portland Cement Division of the company.

Elected Chairman

LEWIS H. BROWN, president of Johns-Manville Corp., Milwaukee, Wis., has been elected chairman and chief executive officer of the company. R. W. LEA, executive vice-president, will succeed Mr. Brown as president.

Resigns

RAYMOND M. BEATON has resigned as vice-president in charge of sales of the Glens Falls Portland Cement Co., Glens Falls, N. Y. He will be succeeded by Stanley H. MacArthur of Scarsdale, N. Y.

Part of the large number of producers and state officials who attended outing of Pennsylvania Stone Producers' Association at Carlisle, Penn., on August 23. Left to right: O. D. Decker, Mansfield, Penn., and Geo. E. Schafer, Rochester, N. Y., General Crushed Stone Co.; J. P. Peacock, Bethlehem Steel Co., Bethlehem; T. C. Frame, chief engineer, Pennsylvania Department of Highways; and James L. Holden, Batavia, N. Y., Genesee Stone Products Corporation

Professor of Geology

RICHARD M. FOOSE, senior geologist of the Pennsylvania Geological Survey, Harrisburg, Penn., has resigned from his position to accept the post of Professor of Geology and head of the Department of Geology at Franklin and Marshall College, Lancaster, Penn. Dr. Foose has been associated with the Pennsylvania Geological Survey since 1939 and, throughout the war, directed all geologic investigations for strategic minerals in Pennsylvania. In addition to his duties in organizing a new department of geology at Franklin and Marshall College, he will continue to serve as a consulting geologist. Dr. Foose is also a member of the Mineral Aggregates Committee of the A.I.M.M.E.

Board Member

WESLEY P. BLIFFERT, an official of the Tewes Lime and Cement Co., Milwaukee, Wis., has been appointed a member of the Shorewood village board to fill the unexpired term of William Bendt. Mr. Bliffert, who was with the Seabees in the South Pacific for three years, is a graduate of the University of Wisconsin.

Sell Block Concern

EDGAR B. WESTLEY AND MELFORD P. SHEFLAND have purchased the concrete block plant at Burnside near Redwing, Minn., from L. S. Heydman and Eugene Berg.

Build New Stone Plant

LIMESTONE PRODUCTS CO., Springfield, Mo., is producing about 400 t.p.d. of crushed stone, including concrete aggregate, road metal, and agricultural limestone. Dwight Freshour, one of the brothers operating a bauxite strip-mining operation in Sweet Home, Ark., is manager of the new plant. Mr. Freshour is a returned veteran, serving 14 months in the Sea Bees including nine months in the Philippines. The crushed stone plant went into production in July, 1946.

Dwight Freshour, manager

New Stone Plant

CALLAWAY QUARRY CO., Auxvasse, Mo., started production of agricultural limestone in June, 1946, with a No. 16 Gilson crusher. Capacity is about 100 t.p.d. The plant is operated by Bias Callaway and Jack Holt, partners, both returned vets. Mr. Callaway spent 2½ years in the Navy and saw service in the South Pacific. Mr. Holt served the same period in the Army Air Corps as a Technical Sergeant, and was in a German prison camp near Roumania for four months.

Jack Holt, to the left, and Bias Callaway

Cement Official Resigns

W. H. KLEIN, vice-president and a member of the board of directors of the Pennsylvania-Dixie Cement Corp., New York, N. Y., has resigned. Mr. Klein served as general operating manager for 12 years, and just recently was appointed vice-president of research and development.

Joins Aggregates Firm

E. W. BOWE, who recently returned from 38 months' service with the Army, has been appointed vice-president and general manager of the Aggregates Corp., Duluth, Minn. Before entering service Mr. Bowe was president of the Precision Products Corp.

Survey Chief Retires

DR. GEORGE H. ASHLEY, Chief of the Bureau of Topographic and Geologic Survey, Department of Internal Affairs, Harrisburg, Penn., has retired and DR. RALPH W. STONE, his assistant, has been appointed to succeed him from September 1 to December 31, when Dr. Stone also will retire on pension.

Partnership

J. C. CARLIN, a chemical engineer, and E. W. HOWELL, an industrial engineer, are president and secretary-treasurer, respectively, of the Carlin-Howell Corp., Nashville, Tenn., which recently purchased the Burgess Lime and Stone Co. quarry at Doyle, Tenn.

Chemist Resigns

WILLIAM A. HOOTEN, chief chemist at the Concrete, Wash., plant of the Superior Portland Cement Co., Seattle, Wash., has resigned to accept a position as superintendent at the Mobile, Ala., plant of the Ideal Cement Co., Denver, Colo.

Society President

ARTHUR C. HEWITT, chief engineer of the Bellefonte Division of Warner Co., Philadelphia, Penn., has been elected president of the newly organized Central Pennsylvania chapter of the Pennsylvania Society of Professional Engineers.

OBITUARIES

B. V. E. Nordberg, son of the late Dr. Bruno V. Nordberg, founder of the Nordberg Manufacturing Co., Milwaukee, Wis., died August 19 at the age of 62. He had been associated with the company since his graduation from the University of Wisconsin in 1907, and had been executive engineer since 1923.

EARL R. HOUCHINS, superintendent of the Thornton, Ill., plant of the Marblehead Lime Co., Chicago, Ill., died August 9 at Chicago Heights, Ill., following a major operation. Mr. Houchins had been employed by the company for 12 years, the last four as superintendent at the Thornton plant.

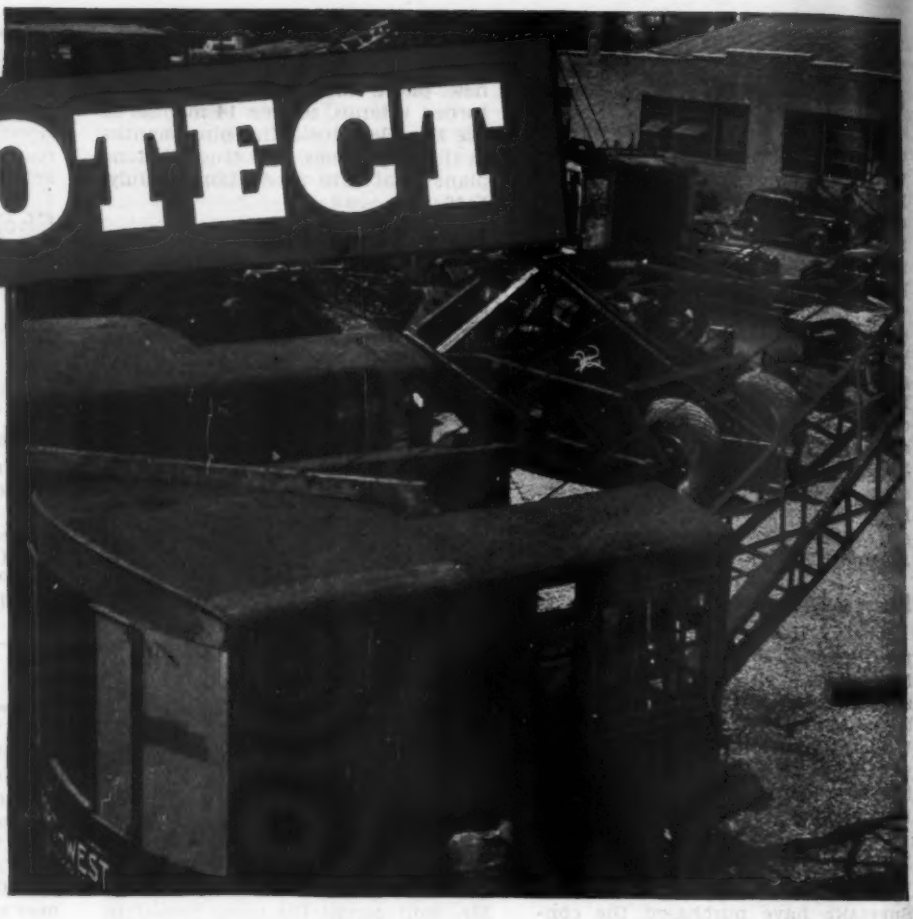
HAROLD C. BOSWELL, vice-president of the Ready Mix Concrete Co., Sioux City, Iowa, died August 13 at the age of 49. Prior to joining the concrete company Mr. Boswell had been associated with L. G. Everist, Inc., for 26 years, and was secretary-treasurer of the concern at the time of his resignation, January 1, 1946.

Henry De Huff, sales engineer in the Philadelphia office of the Easton Car and Construction Co., Easton, Penn., for more than 25 years, died August 22, after an illness of four months.

FRANK RUPRECHT, president and founder of Frank Ruprecht & Sons Quarry & Materials Co., St. Louis, Mo., passed away September 5. He was 85 years of age.

E. J. KRAUSE, president, Columbia Quarry Co., St. Louis, Mo., a past-president of the National Crushed Stone Association and member of the Board of Directors, passed away September 30, after a long illness.

PROTECT your Equipment against RUST



SIMPLY brush *Texaco Rustproof Compound* over exposed metal surfaces. The resulting soft, self-healing, *waterproof* film will give effective protection — usually for a year, at least. *Texaco Rustproof Compound* also removes easily, and is distinctly economical. The cost of Texaco rustproofing every piece of equipment in your yard is far less than the cost of the damage rust may cause to just one machine.

Texaco Rustproof Compound fights rust three ways. It 1) prevents rust from forming; 2) penetrates existing rust and stops further rusting; and 3) loosens existing rust, makes it easy to remove.

Use *Texaco Rustproof Compound* on all metal construction equipment, and on gas holders, water works, sewage disposal plants, bridges — wherever metal is exposed to weather or corrosive chemicals and fumes.

For prompt delivery of *Texaco Rustproof Compound* simply call the nearest of the more than 2300 Texaco distributing plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

FREE! This 36-page booklet tells all about *Texaco Rustproof Compound* — *why* it prevents rust, *where* and *how* to apply it, and how it can add extra years of life to your equipment. A single suggestion in this book may save you thousands of dollars. Write for your copy today.

TEXACO

TEXACO Rustproof Compound

TUNE IN THE TEXACO STAR THEATRE EVERY SUNDAY NIGHT — CBS

OF THE INDUSTRY

Virginia Gypsum Plant

UNITED STATES GYPSUM Co., Chicago, Ill., has received the approval of the Hampton Roads Advisory Council to the CPA, recommending the application of the company for construction of a $670,000 project near Berkley, Va., for a gypsum plaster and plaster board mill. Gypsum rock will be brought from Nova Scotia by boat. The plant will be located on the southern branch of the Elizabeth river, just below the St. Helena Naval Reservation. In addition to the expenditure for buildings and dock facilities, the report states that more than a million dollars will be spent for equipment. The plant is expected to have a daily capacity of 350,000 sq. ft. of ⅜-in. gypsum board.

Sand Pumping Enjoined

DOLESE BROTHERS Co., has been enjoined from operation of a sand pump and sand dredge in the Arkansas River near Wichita, Kans. The State petition claimed that the operations of the company were in violation of the terms of a permit issued by the chief engineer of the Division of Water Resources of the State Board of Agriculture. Operation of the sand pump, it was claimed, changed the course, current and cross-section of the river because waste sand was not returned to the river at its natural angle of repose.

Building Lime Plant

GOLDEN CYCLE CORPORATION is building a $50,000 lime plant north of Colorado Springs, Colo., according to an announcement by A. H. Bebee, general manager. Kilns of new design will take stone of 1½ in. diameter.

Buy Sand Plant

HEDBERG-FREIDHEIM AND Co., Minneappolis, Minn., purchased the sand and gravel plant of Consolidated Materials Co. at Hopkins, Minn., on August 15, 1946 from the former owners, the Cutler-Magner Co. of Duluth. Belt conveyor transportation from the pit to the plant will be installed to eliminate truck haulage and screens will be changed to increase capacity from 150- to 200-tons per hour.

Sue Sand Concern

A SUIT for $92,500 damages has been filed by Alvin R., William L., and A. Stirling Albritton, Baton Rouge, La., charging the Louisiana Sand & Gravel Co., with trespassing in the removal of sand and gravel from the dry bed of the Amite river. An injunction also was sought. Their petition alleges that the river retired from its north bank and encroached on the south bank, forming a new channel on property which is theirs.

Quarry Opens for Airport

STEWART WATSON CONSTRUCTION Co., Madison, Wis., has opened up a new quarry adjacent to U. S. Highway 151, two miles west of Key West, Iowa, to supply part of the crushed rock for the Dubuque, Iowa, airport construction project. Nearly a million dollars will be spent for the CAA airport.

Buy Crushed Stone Plant

FULLER BROS., Butler, Mo., have purchased the equipment owned by Rural Rock and Lime Co., which has been operating southeast of Butler. It is planned to move the equipment nearer this city. Carl Fuller will be in charge of the plant.

Change Owners

THE CARLIN-HOWELL CORPORATION, Nashville, Tenn., has taken over the plant and properties of Burgess Lime & Stone Co., Doyle, Tenn., and has installed modern machinery and equipment to increase production. J. C. Carlin is president, and E. W. Howell is secretary-treasurer.

Approve Sand Plant

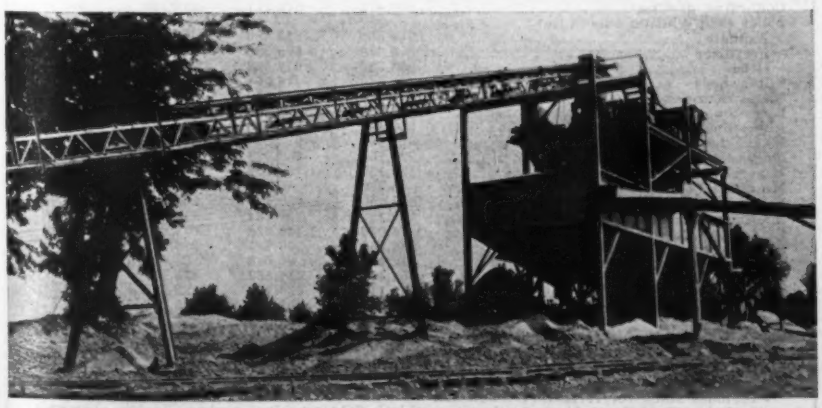
PENNSYLVANIA GLASS SAND CORPORATION, Lewistown, Penn., has received CPA approval for a $519,000 improvement program of the plant near Berkeley Spring, W. Va.

Cement Industry Wins "Anti-Trust" Case

IN A DECISION handed down September 20, 1946, the United States Circuit Court of Appeals for the Seventh District vacated the Federal Trade Commission "anti-trust order" affecting 74 cement producers, virtually the entire cement industry. Announcing the decision, Marquette Cement Manufacturing Co., pointed out that the Court's decision exonerated the cement manufacturers of all F.T.C. charges by upholding the producer's right to absorb freight costs where necessary to meet the prices of competitors located nearer to a particular market. The Court ruled that there was no evidence of conspiracy and that, cement being a standardized product, the common price at any given time and place was necessarily the result of competition. "There is no basis for the Commission's contention that the uniformity of a delivered price was any evidence of collusion between sellers or that any restraint on competition was thereby effected," the Court said.

In this ruling for the cement manufacturers, Judges of the Court sharply criticized the Commission's findings as being "permeated with uncertain and indefinite terms" and its arguments as "most illogical." The Court charged that the Commission's findings, required as the basis of its "cease and desist" order of July, 1943, were not clear and that its brief supporting the order "does not dispell but increases the doubt as to what the respondents agreed to do as a result of the conspiracy charged."

Had the Court not killed it with this decision, the F.T.C. order would have required all cement to be sold f.o.b. plant, "notwithstanding the almost unanimous desire on the part of dealers and purchasers" that it be sold on a delivered price basis, the Court held. The delivered pricing method has been used by the cement industry for nearly 50 years and has never been declared illegal. In exonerating the cement producers from similar charges in 1925, the Supreme Court of the United States held that the cement industry's methods of selling were not unlawful.



At the Denton Sand & Gravel Co., plant at Pacific, the long belt conveyor delivers sand and gravel from dewatering station to main plant for sizing. Under the three two-compartment bins is a blending belt feeding a carloading belt

Wecker Addresses Union

ONE of the featured speakers before the recent convention of the United Cement, Lime and Gypsum Workers Union at Salt Lake City, Utah was President W. A. Wecker of Marquette Cement Manufacturing Co. In opening his address Mr. Wecker expressed the hope that a better union-management relationship would be attained in the cement industry through an understanding of each side's problems. He said that management still had more to learn about the reasons for the viewpoints of workmen, but labor appears to have an unsolved problem in bringing to its members a better understanding of their end of the obligations undertaken by all in a union contract.

"Management has come a long way," he said, "in recognizing that cheap paternalism is not a satisfactory solution to the problems of workmen; that it does not mesh with our American concept of the dignity and freedom of the individual. Labor, on the other hand, understands pretty well today that Industry is not a bottomless horn of plenty from which can be poured forth an endless golden stream quite regardless of the factors that produce that golden stream. There appears to be much more recognition of the fact that Labor and Management operate in a relatively narrow field when they get down to the business of determining who gets what and how much. They are finding that field circumscribed by the public itself who, in the final analysis, determine how much they will pay and at what level of price they will cease to buy. The increasing recognition of these limitations is fast bringing about the understanding that real advancement of the workman's interests is through technological improvements and greater productivity of the individual. We all seem to sense that the struggle for readjustment in the division of the buyer's dollar is nearing an end. Now we seem to be concerning ourselves more with the mechanisms by which we can make basic improvements in productivity and thereby bring about a sounder economic basis for current and future relationships between wages and prices."

COMING CONVENTIONS

American Institute of Mining and Metallurgical Engineers, Annual Meeting, Hotel Pennsylvania, New York, N. Y., February 16-20, 1947.

American Road Builders' Association, Annual Convention, Palmer House, Chicago, Ill., February 17-20, 1947.

National Concrete Masonry Association, Convention and Exposition, Hotel Sherman, Chicago, Ill., week of February 17, 1947.

National Crushed Stone Association, Annual Convention, Edgewater Beach Hotel, Chicago, Ill., January 27-29, 1947; Agricultural Limestone Division, January 30-31, 1947.

National Industrial Sand Association, Fall Meeting, Edgewater Beach Hotel, Chicago, Ill., October 24-25, 1946.

National Lime Association, Fall Meeting, Operating Division, Hershey Hotel, Hershey, Penn., November 4-6, 1946.

National Safety Congress and Exposition, Stevens Hotel, Chicago, Ill., October 7, 1946.

National Ready Mixed Concrete Association, Annual Meeting, Biltmore Hotel, Los Angeles, Calif., week of March 3, 1947.

National Sand and Gravel Association, Annual Convention, Biltmore Hotel, Los Angeles, Calif., week of March 3, 1947.

Purchase Lime Concern

THE PIERCE CITY LIME CO., Pierce City, Mo., has been purchased by the Dixie Engineering Corporation, Miami, Okla. Jack Galloway will be general manager and James Crawford will be local manager. The lime company was founded about 1890 by C. A. Raupp. Gen. W. A. Raupp assumed charge of the plant in 1938 and continued in control until his death.

Enlarge Stone Plant

OTTAWA STONE CO., Ottawa, Ohio, has remodeled its plant near Gilboa and has added new equipment to increase capacity, according to Fred Roose and Al Kersting, owners.

1945 Crushed Stone Figures

SALES of crushed stone in 1945 totaled 152,346,520 tons valued at $161,459,264, according to the Bureau of Mines, a decrease of two percent in quantity but a slight increase in value over 1944.

Fifty-six percent of the crushed and broken stone was used for concrete aggregates and railroad ballast, 85,373,260 tons valued at $80,429,619. Of the 64,108,190 tons used for concrete aggregates, 93 percent was produced by commercial operators. This was an increase of four percent for these producers compared with 1944 whereas Government agencies showed a drop of 40 percent.

Metallurgical users took 18 percent of the crushed stone produced in 1945, but the 27,639,520 tons valued at $22,076,393 showed a decrease of 11 percent in quantity and 12 percent in value compared with 1944. Limestone for agricultural purposes, 17,395,570 tons valued at $25,892,317, or 11 percent of the total, decreased 8 percent in tonnage but increased two percent in value. Refractory stone, 2,526,650 tons valued at $4,545,339, showed an increase of 9 percent in quantity and 16 percent in value. In 1945, limestone constituted 74 percent of all crushed and broken stone sold, excluding that for cement and lime manufacture. Crushed limestone sales in 1945 compared with 1944, follow:

Use	1944 Short Tons	1944 Value	1945 Short Tons	1945 Value
Riprap	1,584,060	$ 1,828,330	1,777,940	$ 2,033,420
Fluxing stone	31,080,330	25,130,113	27,639,520	22,076,393
Concrete and road metal	40,180,460	40,166,631	42,455,370	43,727,822
Railroad Ballast	9,361,070	7,275,853	9,307,200	7,377,682
Agriculture	18,941,220	25,316,219	17,395,570	25,892,317
Alkali works	6,990,370	4,279,141	7,076,330	4,068,060
Calcium carbide works	509,860	476,292	549,510	639,833
Coal-mine dusting	196,470	624,217	216,160	680,723
Filler (not whiting substitute):				
Asphalt	449,560	855,480	455,360	971,570
Fertilizer	373,970	599,932	401,160	661,348
Other	236,720	677,522	138,750	428,991
Filter beds	20,880	44,064	20,920	38,322
Glass factories	512,710	820,150	460,750	792,067
Limestone sand	380,230	278,970	615,400	482,093
Limestone whiting[1]	352,490	2,554,728	343,220	2,905,637
Magnesium metal (dolomite)	652,610	983,359	[2]	[2]
Magnesia works (dolomite)[3]	220,160	450,328	295,540	373,919
Mineral food	254,150	1,193,706	291,580	1,310,757
Mineral (rock) wool	43,480	45,610	39,170	39,575
Paper mills	375,490	630,425	352,990	620,943
Poultry grit	130,450	701,194	114,670	751,469
Refractory (dolomite)	1,075,050	1,130,022	1,027,090	1,120,136
Road base	885,460	706,341	298,930	283,979
Stucco, terrazzo, and artificial stone	12,460	80,518	25,590	148,332
Sugar factories	254,410	431,462	436,170	837,470
Other uses[4]	202,140	438,703	199,800	300,319
Use unspecified	68,230	207,678	305,250	423,321
	115,344,490	117,926,988	112,239,940	118,936,498

[1] Includes stone for filler for calcimine, caulking compounds, crayons, explosives, foundry facing powder, leather goods, linoleum, paint, paper, phonograph records, plastics, pottery, putty, roofing, rubber, tanning, tooth paste, wire coating, and unspecified uses.
[2] Included under "Other uses."
[3] Includes stone for refractory magnesia.
[4] Includes stone for acid neutralization, athletic-field marking, carbon dioxide, chemicals (unspecified), concrete blocks and pipes, electric products, fill material, oil-well drilling, rayon, rice milling, spalls, spray, waste rock, water treatment, and (1945) magnesium metal.

Gravel "Not Mineral"

ACCORDING to a ruling by Attorney General Burnquist of Minnesota, ordinary sand and gravel are not considered minerals within the meaning of statutes of the State reserving mineral rights in the sale of State lands. The opinion was in answer to a request by Chester S. Wilson, commissioner of conservation, to clarify administrative responsibilities in connection with the leasing of sand and gravel bearing properties to which the State has title. The ruling applies only to sand and gravel used for road construction and concrete work, and in the building industry. It does not apply to building stone or other "stone possessing a peculiar purpose" or characteristics giving it a special value or with quartz or silica sands.

Oklahoma Conference

OKLAHOMA MINERAL INDUSTRIES CONFERENCE meeting will be held in Ada, Okla., November 7, 8, and 9. President W. A. Delaney, Jr., has announced that the program will include recognized leaders of industry. A mineral and industrial tour will be arranged.

Open New Gravel Plant

THE CONCRETE MATERIALS CO., Waterloo, Iowa, has started operating a new $400,000 sand and gravel plant near the Raccoon river in West Des Moines, Iowa. The company has about 200 acres of river bottom land underlain with sand and gravel. It is a wet pit operation with a production of about 350 tons an hour.

Reopen Quarry

BRUCE ALEXANDER, Augusta, Kans., has announced that the old Alexander quarry has been leased to a Wichita, Kans., concern for the production of agricultural limestone and ballast.

Correction

ON page 166 of the August issue of ROCK PRODUCTS, in a report of papers presented before the American Society for Testing Materials annual convention in Buffalo, N. Y., authorship of a paper on Air-Entraining Concrete was incorrectly stated. F. B. Hornibrook, one of the authors, formerly with the National Bureau of Standards, is now identified with Master Builders Research Laboratories, but Howard Freiburger is with the National Bureau of Standards, now on military leave, and Albert Litvin, is materials engineer, with the Bureau.

Start Gravel Business

COLUMBIA AGGREGATES CO., Moses Lake, Wash., is the name of a new sand and gravel concern which has been started by Charles R. Bennett and John G. Nelson of San Francisco, Calif. Both partners were officers in the Navy.

Adds Ready Mix

WINONA READY MIXED CONCRETE CO., is the name of a new plant recently placed in operation at Winona, Minn. Herman Dunn, who also operates a sand and gravel plant at Rochester, Minn., is the owner.

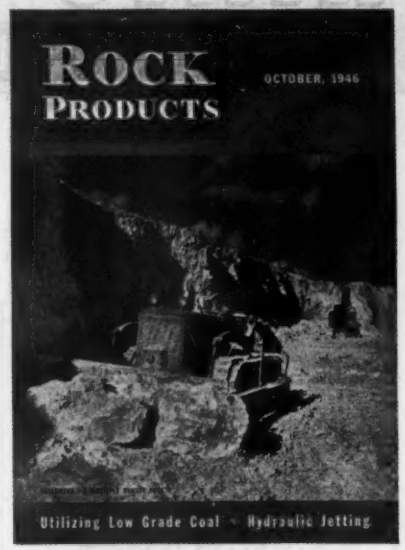
Recover Sand Pump

THE CLAY CENTER SAND CO., Clay Center, Kans., has located and recovered all the sand pumping equipment which was floated away by recent floods.

Sand and Gravel in 1945

OUTPUT of sand and gravel in 1945 was 195,524,000 tons valued at $128,837,000 compared with 194,783,000 tons valued at $125,164,000 in 1944, according to final figures released by the Bureau of Mines. Approximately 78 percent of the output was supplied by commercial plants and 22 percent by federal, state, county, and municipal governments. Sales by commercial producers in 1945 were 152,138,298 tons, increasing one percent over the 150,633,081 tons produced in 1944. Demands for building, paving and railroad ballast requirements increased four percent to 133,581,481 tons from 128,712,964 tons in 1944, due to a 16 percent increase in building sand, and an 8 percent increase in building gravel. The comparative figures for 1945 and 1944 are shown below:

COMMERCIAL OPERATIONS	1944 Short Tons	1944 Value Total	1944 Value Average	1945 Short Tons	1945 Value Total	1945 Value Average
Sand:						
Glass	4,443,031	$ 8,227,502	$1.85	4,681,920	$ 8,374,218	$1.79
Molding	8,983,075	11,752,360	1.31	7,190,856	9,724,750	1.35
Building	26,356,834	16,154,889	.61	30,490,146	18,812,208	.62
Paving	16,886,764	10,319,762	.61	16,681,521	10,428,371	.63
Grinding and polishing	897,983	1,563,511	1.74	642,511	1,029,501	1.60
Fire or furnace	362,978	479,711	1.32	308,997	387,872	1.26
Engine	2,852,648	1,993,119	.70	2,771,896	1,924,725	.69
Filter	146,008	263,922	1.81	109,845	231,026	2.10
Railroad ballast	1,211,894	381,489	.31	1,682,626	400,762	.37
Other	1,388,749	1,012,608	.73	1,116,353	1,117,153	1.00
Total commercial sand	63,529,964	52,148,873	.82	65,076,671	52,430,586	.81
Gravel:						
Building	25,946,102	19,729,145	.76	27,910,042	21,735,554	.78
Paving	37,043,972	26,199,925	.71	36,759,164	25,693,994	.70
Railroad ballast	21,267,398	9,433,662	.44	20,657,982	9,518,328	.46
Other	2,845,645	1,284,632	.45	1,734,439	1,043,910	.60
Total commercial gravel	87,103,117	56,647,364	.65	87,061,627	57,991,786	.67
Total commercial sand and gravel	150,633,081	108,796,237	.72	152,138,298	110,422,372	.73



This Month's Cover

EARTHMOVING EQUIPMENT of the type pictured on the front cover is destined to play a large part in postwar operations of the rock products industries. A relatively "new" piece of equipment for these industries, tractor and bulldozer-grader combinations have found diversified utility; in stripping and clearing ahead of excavation, actual excavation in some loose material deposits, trimming of stockpiles, the reclamation of stockpiled materials to reclaiming tunnel belt conveyors, cleanup around excavating and haulage equipment and many other applications.

In the illustration is shown a tractor with bullgrader cleaning up the quarry floor at the Camp Concrete Rock Co., Ocala, Fla. The plant produces from 1500 to 2500 tons of crushed limestone per day.

Cement Production

BUREAU OF MINES reports that production of finished cement during June, 1946, totaled 14,489,000 bbl. or 62 percent greater than that reported for June, 1945. Shipments of 14,558,000 bbl. were 44 percent greater than those reported for the corresponding month of 1945. Mill stocks on June 30 were 1 percent lower than on May 31, 1946, and 36 percent lower than a year ago. Demand for cement, as indicated by mill shipments, was higher than in June, 1945, in all continental districts, but was lower in Puerto Rico. In two districts and Hawaii shipments were more than double those of June, 1945.

The following statement gives the relation of production to capacity, and is compared with the estimated capacity at the close of June, 1946, and of June, 1945.

RATIO (PERCENT) OF PRODUCTION TO CAPACITY

	June 1946	June 1945	May 1946	Apr. 1946	Mar. 1946
The month	45.0	73.0	59.0	64.0	55.0
12 months	39.0	54.0	52.0	50.0	48.0

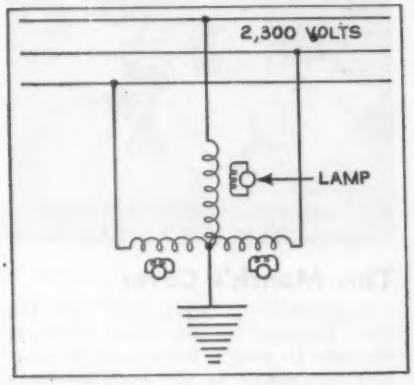
HINTS and HELPS

PRACTICAL IDEAS DEVELOPED BY OPERATING MEN

Ground Detector

By PAUL C. ZIEMKE

GROUND DETECTION devices are quite ordinary installations on low voltage circuits where lamps in series or in parallel serve their purpose well;



Wiring diagram of transformer and lamp installation to detect grounds on three-phase 2300-volt circuit

however, it is very important that immediate detection of grounds on primary circuits be available to permit the operator or chief electrician to clear the line before a break-down occurs.

The diagram indicates how this can be done by the installation of three potential transformers, ordinarily used to couple up metering circuits, and three 110-volt lamps. On a ground-free 2,300-volt circuit, for instance, the lamps are energized by 64 volts. When a ground develops on one phase, the lamp in that leg will either dim or go out completely, depending, of course, on the resistance of the accidental ground. On so-called "dead" shorts to ground the remaining transformers have full voltage applied which lights the lamps to full brilliance.

In our plant one set of lamps is located in the engine room, and a second set is installed out on the main aisle adjacent to the main load center where the maintenance staff may readily be aware of impending trouble and take early steps in locating it.

Proportioning Containers

CONCRETE MASONRY PRODUCTS CO., Joplin, Mo., unable to secure needed equipment, designed and fabricated its own proportioning containers for aggregates as well as a system of introducing aggregates to the mixer. Shown in the accompanying illustration is a 2½-cu. ft. bucket, fabricated from ⅛-in. plate steel and welded. The bucket is suspended by cable from a jib crane having a tubular steel boom that moves in an arc from the aggregate bin to the cart that feeds the mixer. The jib crane frame consists of an upright steel pipe, 2-in. in diameter with a 1½-in. steel pipe boom extending from it. The boom is supported by a stiffening strut consisting of a 1½-in pipe and a shorter 1-in. pipe, as shown in the sketch. The cable is attached to the bucket on off-center projections that allow the bucket to be tilted and

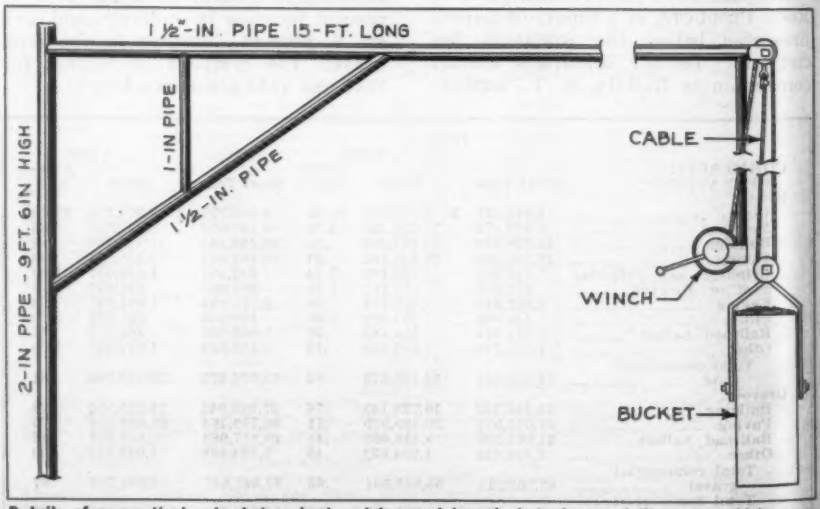
Loaded batching cart in position to charge mixer

emptied. Above the bucket, the cable is run through a pulley and winch arrangement, that allows the bucket to be raised and lowered by turning a handle.

Fine aggregates, measured in this

Batching bucket elevated by hand winch and cable to jib crane

bucket, are deposited into a ⅓-cu. yd. cart, fabricated of No. 12 gauge steel plate, and mounted on small mine cart wheels. The cart runs over a 12-lb. rail from the coarse aggregate stockpile to the mixer. After the fine aggregate has been placed into the cart from the swinging bucket, the coarse aggregate is added and the cart is pulled to the mixer, over the tracks, by a cable attached to a pulley above the mixer. The cable is attached to the drive shaft of the mixer, and moved when a Dodge clutch, installed on the drive shaft,



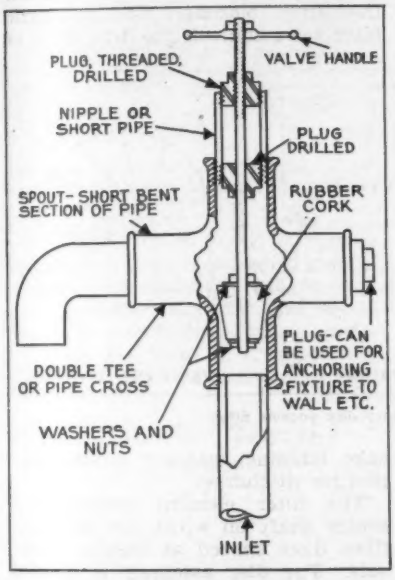
Details of proportioning bucket, raised and lowered by winch to boom of jib crane which moves aggregates from stock pile to mixer

is thrown in to make contact. As the cable, attached to the rear of the cart, pulls the cart to the mixer, the front end of the cart catches on a lip at the mixer, holding the front end of the cart in place as the rear end is elevated, thus allowing the contents to discharge into the mixer.

Emergency Water Tap

By J. F. PRUYN

VALVES AND WATER taps very often present a tough problem these days when plumbing fixtures are difficult to obtain. One outfit solved their problem this way. With a few pipe fittings and some unorthodox thread-



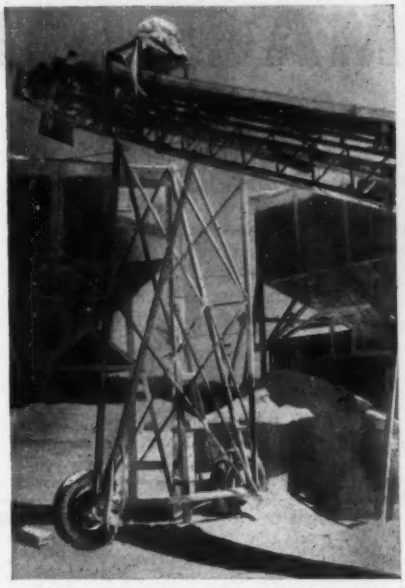
Emergency water tap

ing, they rigged up their own valves, and faucets.

They claim good maintenance features. The valve shown in the sketch has been improved by smoothing the valve-seat (for the rubber cork) with emery cloth. If the valve starts leaking, the cork can be made to bulge and thus fit the seat better by simply cinching up on the bottom nut that holds the cork.

Movable Conveyor

CARTHAGE MARBLE CORPORATION, Carthage, Mo., has constructed a framework under the discharge end of a belt conveyor so that it can be swung in an arc of about 160-deg., to allow loading railroad cars, bins, or a secondary crusher. As shown in the illustration, the framework under the conveyor is constructed of steel tubing. This framework is mounted on two truck wheels, with rubber tires, and the whole assembly can be moved either by truck or by two men. The lower end of the conveyor assembly is placed on a steel plate,



Conveyor supported on frame with two rubber-tired wheels, can be moved to discharge to several locations

connected to another steel plate set in a concrete base, to act as a swivel. The two plates are joined by a bolt, sunk into the concrete base.

Trucks Stockpile Over Wire Matting

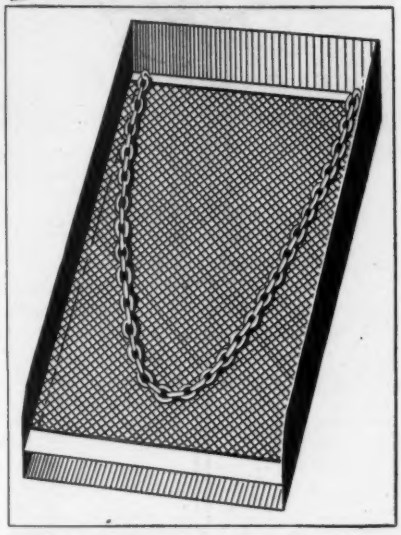
PICTURED in the accompanying illustration is a wire mat secured at the lower end and supported at the other end by cable and pulley to a counter-weight, that allows trucks to drive on a sand stockpile at the Kansas City Quarries Co., Kansas City, Mo. The wire mat which provides

Wire screen matting allows trucks to drive on sand stockpile for discharge at any point under screen

traction for the wheels, permits the trucks to drive over the pile for discharge at any point in the length of the mat.

Chain on Screen Breaks Up Caked Stone

TO PROMOTE greater screening efficiency for crushed stone that cakes and balls up when damp, the Ash Grove Lime and Portland Cement Co., at its Springfield, Mo. plant, has placed a chain on the screening sur-



Chain, secured at upper corners of vibrating screen, rides on screen and assists in breaking up caked, damp limestone

face of a vibrating screen, attached at the two ends as shown in the accompanying illustration. Caked stone, passing over the screen, is broken up when it comes in contact with the chain, thus allowing the fines to drop through the screen instead of riding over as oversize.

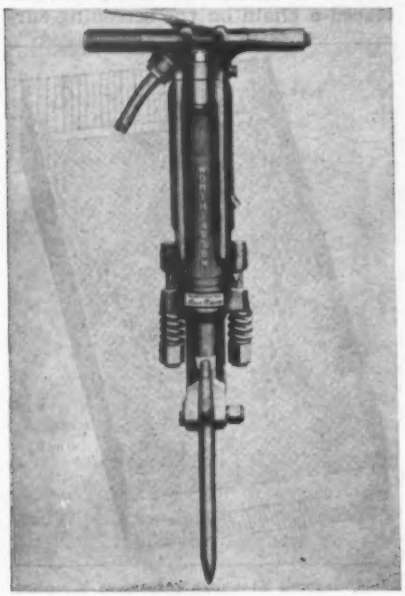
Water Retentivity of Limes

NATIONAL BUREAU OF STANDARDS is now compiling information on the water retentivity of various hydrated limes when added to portland cement mortars. The various limes as they are added to improve the plasticity and increase the water-retaining property of the mortars differ in their effectiveness, and specific information on the subject is needed as a guide. In order to get a fair cross section of the various types the Bureau tested the water retentivity of 46 different limes. The high calcium group showed the greatest variation in water retentivity, from 74 to 96 percent retention. Dolomitic limes range from 82 to 91 percent, while pressure hydrated limes gave values between 90 and 96 percent. Magnesium and silo-hydrated limes ranged between 89 and 96 percent.

NEW MACHINERY

Paving Breaker

WORTHINGTON PUMP AND MACHINERY CORPORATION, Harrison, N. J., has designed a paving breaker, known as the WB-81, which is said to have several improvements to promote ease in handling and durability. It has been used in field tests to break boulders where it is impossible to blast.



Breaker has positive action, end-seating, automatic valve not affected by wear

Diesel-Electric Locomotive

DAVENPORT BESLER CORPORATION, Davenport, Iowa, has brought out a 35-ton, narrow gauge, Diesel-electric locomotive powered with two Hercules engines, two generators and two motors. It is a quiet, flexible haulage unit developed as a result of war experience when many Diesel-electric locomotives were made for the government.

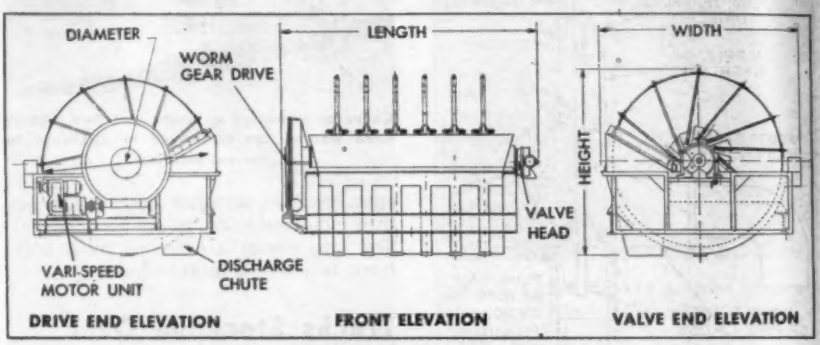
Diesel-electric locomotive recently delivered to the Pittsburgh Limestone Corporation

Vacuum Filter

GENERAL AMERICAN TRANSPORTATION CORPORATION, New York, N. Y., has developed the Conkey rotary disc vacuum filter for many dewatering operations, including cement slurry and flotation concentrates. They are furnished in both the conventional "pie-shaped" sector disc and the improved tangential segment disc for slow filtering pulps.

The multiple disc filter operates on the identical cycle of operation of the rotary drum vacuum filter. Following submergence for the cake building cycle, the discs travel through an arc wherein the filter cake is washed free of original solution or to remove other soluble constituents, by atomizing spray application of wash waters.

It is said that the subsequent cake drying cycle is particularly effective, for, due to sectionalized disc design with gravity flow of filtrate, low cake moistures are obtained. Positive cake discharge by blow-back, reverse flow of air on filter discs, is also said to be effective in keeping filter medium free from binding. The automatic filter valve controls the filter cycle of cake building, washing, drying and positive discharge.

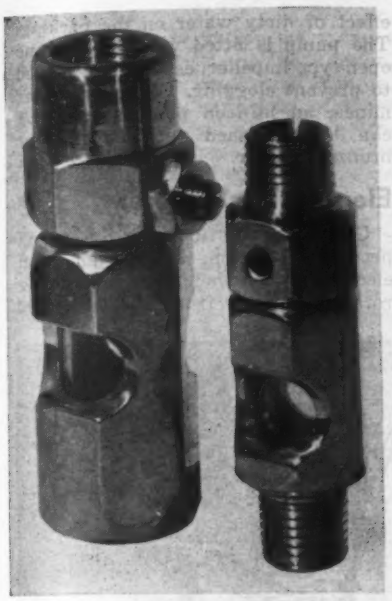


Construction details of rotary disc vacuum filter

The filter element comprises a center shaft on which are mounted filter discs spaced at regular intervals. The disc assembly is divided into a number of independent and interchangeable sections, each individually dressed, thus permitting the replacement of the filter medium on individual sectors as required. Sectors making up each filter disc are individually removable and are held in place by radial rods, fitted with sector clamps and holding down lock nuts. The filter element trunnion extensions rotate in pedestal bearings which are interconnected by a structural frame to insure alignment of the filter element within filter tank.

Sight Feed Valve

OIL-RITE CORPORATION, Milwaukee, Wis., has brought out a sight feed valve for oil circulating systems which is claimed by the manufacturer to be exceptionally sturdy with an unbreakable plastic sight. These sight feed valves are used wherever the rate of oil flow must be visually checked and regulated permitting occasional adjustment of fixed settings. They are usually adapted to circulating oil systems or multiple oiler arrangments for feeding a number of bearings from a central reservoir.



Sight feed valves for oil circulating system which can be quickly adjusted for oil flow

To adjust the oil flow, it is only necessary to place a standard hexagonal key through the hollow lock screw into the set screw and adjust to suit. To lock desired setting, partly withdraw key until it engages only lock screw, then tighten lock screw.

Diesel Crawler Tractor

INTERNATIONAL HARVESTER CO., now is in production on its TD-24, Diesel crawler tractor which was announced at the Associated Equipment Distributors' meeting last January. This is the largest tractor ever built by the company, weighing about 35,000 lb., and within the 130 drawbar hp. range.

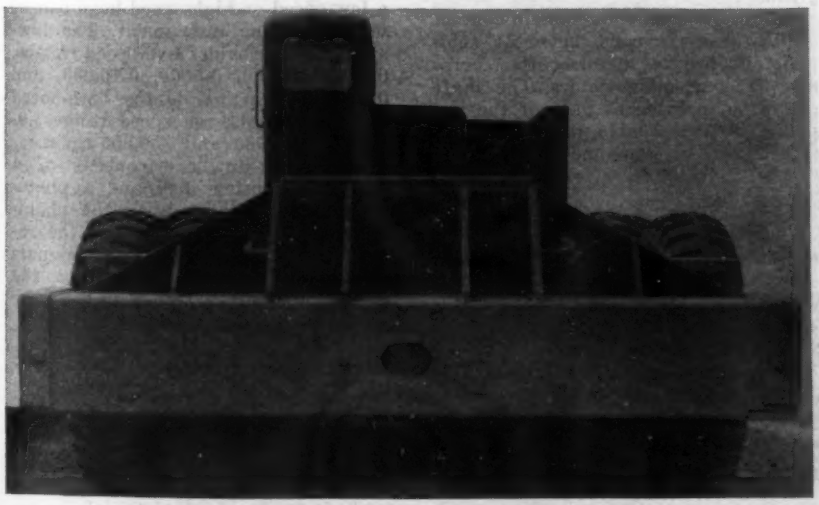
In the illustration, the tractor is shown drawing a Mississippi Wagon, made by M-R-S Manufacturing Co., in a stripping operation. In this application, the tractor is equipped with a hydraulic system that brings the weight of haulage unit to bear on the tractor rear wheels when a hard pull is encountered.

The TD-24 has eight speeds, from 1.6 to 7.8 m.p.h. A new International 6-cylinder, full-diesel engine powers the tractor which is equipped with a built-in gasoline starting system, together with an electric starter, to assure easy starting in all weather conditions.

Tractor-trailer haulage unit. Tractor is equipped with a hydraulic system that brings the weight of the haulage unit to bear on tractor rear wheels

Truck Crane

KOEHRING CO., Milwaukee, Wis., has brought out its No. 304 truck crane which has a capacity of 40,000 lb. with outriggers, 15,800 lb. without outriggers. The same base machine used on the 304 crawler model is utilized on the 304 truck crane. It has been designed for easy handling on street or highway with its high travel speed. Removable outriggers are optional, permitting operation as a shovel, pull shovel or dragline.



Outrigger on truck crane, permits operation as shovel or dragline

Truck-Tractor Winches

GAR WOOD INDUSTRIES, INC., has announced a series of single lever truck and tractor rapid-reverse winches originally developed for the armed forces. There are three sizes in production: 15,000, 30,000 and 60,000-lb. pull.

Instantaneous change in direction is achieved in this type winch at full load and under full speed by a single straight-line shift without engaging or disengaging the engine clutch. The manufacturer states that use of the engine clutch is necessary only at the beginning and end of the job to engage and disengage the power take-off.

The reversing mechanism consists of a double-ended modified jaw clutch sliding on splines or an input shaft which meshes with clutch gears on either end of the shaft. One of these clutch gears meshes directly with the worm shaft and the other meshes through a reverse idler. The shock of engagement of full load and speed is absorbed by a torflex sprocket with rubber bushing.

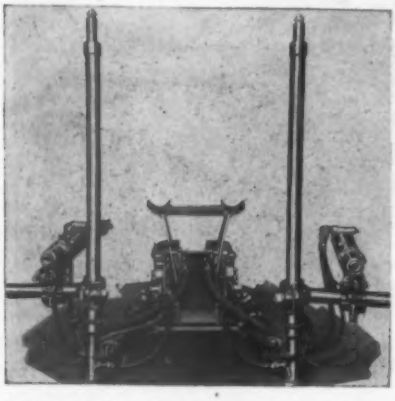
Announcement also has been made of a line of worm-geared tractor winches for use with Allis-Chalmers tractors. This series is designed for heavy duty, slow-speed towing, and is made in three models with a maximum line pull of 60,000 lbs.

Concrete Floors

LONE STAR CEMENT CORPORATIAN, New York, N. Y., has prepared an interesting booklet on concrete floor construction, patching, and re-concreting old floors. The common construction faults are listed, and complete specifications are given for laying heavy duty floors, and proper methods of curing. It is profusely illustrated to show how the work is to be done.

Drill-Jumbo Mounting

INGERSOLL-RAND CO., Phillipsburg, N. J., is now in production on an air-operated drill-jumbo mounting for safer work and faster set-ups than



Air-operated, drill-jumbo mounting which may be attached to mine car

with hand methods. The manufacturer points out that installed permanently on a mine car, the resulting unit does the work, not only setting up but of transporting the drifters, drill steel, hose and accessories to the heading.

On arrival at the face, the miners have only to swing the air columns into a vertical position, the footpiece hinges being designed to make full use of the force of gravity to aid the operation. Air is then turned on which pushes the column pistons firmly against the roof. No blocking is needed and the drills are ready to operate. Little effort is required to move the arms and drifters up or down the column with the hand cranks provided. The entire unit is rigid since a force of 600 lb. holds the column and car solidly in place. Roof jacks are therefore eliminated.

Portable Apron Feeder

PIONEER ENGINEERING WORKS, INC., Minneapolis, Minn., has brought out a portable apron feeder which is in effect a portable conveyor for heavy, sharp, abrasive rock for which a belt conveyor may be impracticable.

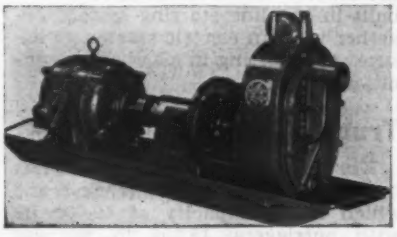
This long feeder, mounted on its own chassis and wheels, with hopper attached, can be swung into place quickly for short-time set-ups. It is 36 in. wide, measures 30 ft. from center to center of head and tail shafts, and is supported on a single axle equipped with dual pneumatic tires.

Feeder pans are ½ in. thick forged steel plate, with overlapping corrugations to give added strength against impact and load and to prevent spillage at the sides. Drive is from the crusher to the feeder head shaft through a clutch and built-in gear reduction.

Mine Pump

MARLOW PUMPS, Ridgewood, N. J., has developed an improved mine gathering pump which is said to cut mine drainage costs substantially. It is a self-priming centrifugal pump, being self-priming on suction lifts as high as 25 ft. According to the manufacturer, the design permits relatively large clearances between the tips of the impeller vanes and the ends of the diffusor vanes, thereby retaining its ability to prime, even when large quantities of solids are handled.

This type EM pump is available in two sizes; 2 in. with 2 hp. and 3 hp.



Self-priming centrifugal pump designed for mine drainage work

motors, and 3 in. with 2 hp. and 3 hp. motors, all operating at 1800 r.p.m. Pump and motor on sled-type base measure 23⅞ in. high, 12¾ in. wide and 57 in. long. Capacity is 40 to 240 g.p.m.

All pump parts that come in contact with water are constructed of acid-resistant bronze to offset the corrosive effect of mine waters. The shaft sleeve is an integral part of the impeller. A replaceable labyrinth ring is designed to overcome the abrasive effect of dirty water on the packing. The pump is fitted with a four-vane open-type impeller, especially designed to prevent clogging. For sweet water mines, an all-iron pump (type EL) can be furnished with an iron or bronze impeller.

Portable apron feeder serves as a conveyor to handle abrasive rock

Electric Tachometer

GENERAL ELECTRIC CO., Special products Division, has designed an electronic tachometer for measuring rotating speeds from 300 to 50,000

Measuring speed of milling machine mandrel with electronic tachometer

r.p.m. It can be used to indicate the speeds of electric motors, machine tools, automotive engines, pumps, fans, blowers and other types of rotating equipment.

The electronic tachometer consists of a small pick-up head, 6 ft. of flexible cable, and a measuring unit with a panel-mounted indicating instrument reading directly in r.p.m. Either a low-speed or high-speed head can be used with the instrument. The low-speed head provides five speed ranges, 0-1000, 0-2000, 0-5000, 0-10,000, and 0-20,000 r.p.m., while the high-speed head provides three speed ranges, 0-10,000, 0-20,000, and 0-50,000 r.p.m.

Each pick-up head consists of a light-interrupting disk and a phototube. Light shining upon the phototube through the openings in the rotating disk produces input signals which are then transferred to the measuring unit, which indicates the r.p.m. of the equipment being tested.

Electronic Timer

PHOTOSWITCH INCORPORATED, Cambridge, Mass., has announced its electronic timer, type 30HL1, designed as an automatic timer for intervals from 1/20th second to four minutes. This timer is used to control such equipment as conveyors, automatic filling

machines, spot-welders, grinders, etc.

This timer provides four basic types of timing: interval, delayed action, automatic repeat, and programming, as well as many variations of these types. Either 115-volt or 230-volt supply line may be used. Low line voltages do not affect the timer's operation.

Rock Breaker

UNIVERSAL PNEUMATIC TOOL CO., INC., St. Louis, Mo., has developed what has been termed its Maloney concrete and rock buster. It is an integral unit of specially treated steel operating in movable slides which expand in parallel lines contacting the inner surface of the drilled hole, resulting in clean breakage. To use, merely drill a hole big enough to receive the "rock buster" and drive down with air hammer or sledge. To control direction of break, place tool in drilled hole so opening between the two slides points in direction of desired break. The expansion of the two slides in the drilled hole as the upper part of the buster is driven down provides a clean break.

Heavy Duty Trucks

DODGE DIVISION, CHRYSLER CORPORATION, Detroit, Mich., is now in production on three heavy duty trucks, each available in 10 different models. The 30 new models are manufactured in 60 gross vehicle weight classifications ranging up to 23,000 lb., and in tractor-trailer ratings up to 37,000 lb.

One of the 3-ton heavy duty truck models available in five wheelbases ranging from 136 to 196 in.

This heavy-duty line includes a 2½-ton truck of 18,000 lb. gross vehicle weight in five wheelbases ranging from 136 to 235 in.; a 3-ton truck of 20,000 lb. gross vehicle weight in five wheelbases ranging from 136 to 196 in., and a 3-ton heavy-duty truck of 23,000 lb. gross vehicle weight in five wheelbases ranging from 136 to 196 in.

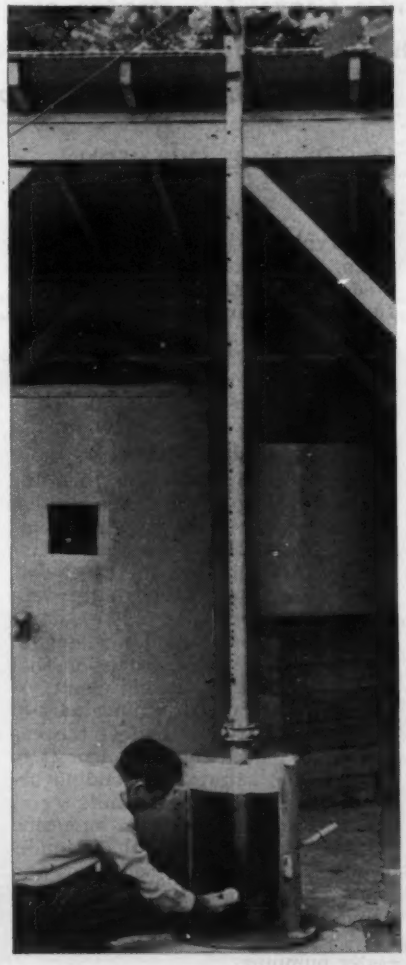
Engines for these trucks were developed for service over the Burma Road in World War II. The 6 cylinder engine which powers the 2½-ton line has a 3¾-in. bore and 4¼-in. stroke with 281.64 cu. in. piston displacement. Compression ratio is 6.5 to 1. It develops 115 hp. at 3200 r.p.m. and 225 lb.-ft. of torque at 1200 r.p.m. The 6 cylinder engine which powers the 3-ton and the 3-ton heavy duty lines has 3¾-in. bore and 5-in. stroke with 331.35 cu. in. piston displacement. Compression ratio is 6.5 to 1. It develops 128 hp. at 3000 r.p.m. and 270 lb.-ft. of torque at 1200 r.p.m.

All truck models have five-speed transmissions, and rear axles are of full-floating hypoid design. Rear brakes are the floating-shoe type. The 2½-ton line is equipped with 9½-in. diameter single diaphragm-type brake booster, and the 3-ton line is equipped with a dual diaphragm 9½-in. diameter booster. Air brakes are available as extra equipment. The 3-ton models use a heavy-duty cam and twin lever type steering gear with a varying ratio.

Blasting Fuse Cap

OLIN INDUSTRIES, INC., East Alton, Ill., has announced that RDX, a very powerful chemical explosive developed during the War, is the basic charge of the Western "Big Inch" blasting fuse cap. F. S. Elfred, Jr., general manager of the explosives divisions of the company, points out that RDX has 50 percent more power than TNT. The cap is slightly more than 1¼ in. in length and less than a ¼-in. in diameter.

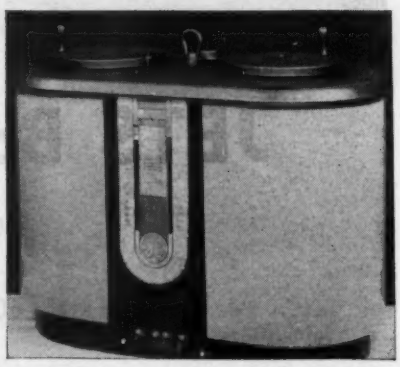
Although powerful, the caps are said to be safe to handle as they can withstand the shock of a heavy impact without detonating. Because they are short, they can be easily buried in the smallest stick of dynamite. As they are made of shining aluminum they can be easily found when accidentally dropped on dark mine floors. The caps can be used in all types of blasting requiring the use of fuse caps, such as quarries, open pits, mines, highway excavation, and construction work.



Safety impact apparatus used to determine ability of a cap to withstand a heavy blow

Twin Unit Arc Welder

GENERAL ELECTRIC CO., Schenectady, N. Y., has announced the development of a twin-unit, outdoor arc welder by the Electric Welding Division.



Outdoor twin-unit arc welder, rated 60 cycles, 200 amp., 220/440 to 75 volts

Each of the two circuits in the welder can be used simultaneously and independently with electrodes up to 3/16 in. in diameter, or combined into one circuit for heavy welding with ⅜-in. electrodes. The units have a current range of from 90 to 270 amp., when used singly and from 180 to 540 amp. when operated in parallel.

Both welders are equipped with control which reduces the open circuit voltage to approximately 30 volts when the machine is not welding, but which makes full power available the instant the arc is struck. Both halves are supplied through a single set of primary terminals so that only one power-line circuit to the unit is required.

Test Lamp-Voltage Indicator

HOLUB INDUSTRIES, INC., Sycamore, Ill., has brought out a combination safety test lamp and voltage indicator. The "Hi" Tester, as it is called, is a pocket instrument which is equipped with a filament lamp and has only one test lead which prevents shorting out the resistor. It is for use on a.-c. or d.-c. circuits to locate grounds, opens, blown fuses, motors running single phase, tracing control and other circuits, and to indicate approximate voltage.

Dredge equipped with jet pipe line connected in series with suction line to increase percentage of solids pumped through pipe

JETS Boost Pumping Capacity

Rapides Gravel Co., dredge equipped with jet pumps an average of 600 tons per hour with 10-in. pump

By H. E. SWANSON

APPLICATION OF JETS in the hydraulic excavation of sand and gravel, while not an entirely new process by any means, is probably being applied on a greater scale and with greater success in operations of H. H. Holloway, one of the South's outstanding sand and gravel producers, than in other earlier attempts. As perfected by Mr. Holloway, the jetting principle has proven practicable over a number of years and is applied in all his plants, where it is not uncommon to pump as much as 75 percent solids through pipelines.

For those in the industry unfamiliar with the principle of jetting, the process consists in general of forcing fresh water, from an auxiliary pump, through a venturi built into the suction line connecting to the excavating pump, creating a suction within the line that supplements the excavating pump in the raising of solids from the deposit.

The new dredge installation of the Rapides Gravel Co., Woodworth, La., owned by Mr. Holloway, is equipped with jetting and is described herein. It was placed in operation in July, 1945, and consists principally of a 10-in. Type H Amsco excavating pump powered by a four cylinder, 240-hp. Fairbanks-Morse Diesel with 14- x 17-in. cylinders, and an 8-in. Type 32, Amsco counterflow jetting pump, powered by a D-13000 Caterpillar Diesel. A Fairbanks-Morse self-oiling Typhoon pump, rated at 215 r.p.m. 100 p.s.i., and 5000 g.p.h., powered by the Fairbanks-Morse Diesel, furnishes water for the back plate and stuffing gland of the excavating pump. The Caterpillar Diesel also powers an American hoist that raises and lowers the 83-ft. 9-in. suction pipe.

How Jet Operates

Connected to the suction line, and parallel to it, is an 8-in. pipeline that carries fresh water from the jetting pump. Water enters the suction line through a channel at the lower end, where it is forced through the venturi, causing a suction in the suction pipe. Secured to the lower end of the suction line is an extension that forms the venturi, leaving about ¼-in. opening around the inner part of the pipe. The lower end of the extension is placed into the deposit to reclaim the material. Extending beyond the channel that admits water into the suction line is an extension of the fresh water line, that reduces down to 1½-in. nozzle opening, and sends a stream of water directly into the deposit in advance of the suction line, to lubricate the deposit for easier pumping.

The fact that a normal pumping operation will yield only from 10 to 20 percent solids illustrates the efficiency and economy attained by jetting, where 75 percent solids can be pumped with only the addition of an additional pump with its required power. Some time ago, Mr. Holloway made a test run at another of his plants to determine how jetting affected production and how much extra power was needed. In three hours and 15 minutes, 45 carloads of aggregate were produced, together with some wasted material. The average was better than 800 tons per hour, which represented a 300 percent increase in capacity as compared to operation with the same 10-in. pump without the jet, with an increase in power requirements of 100 percent. Production at the Rapides Gravel Co. averages 600 tons per hour.

Dredge Pontoons Hold Oil

The new dredge boat was constructed of two steel pontoons connected by means of bolted flanges to form a boat 65 ft. long, 28 ft. wide, and 7 ft. deep. Compartments in the pontoons act as fuel storage tanks with a total capacity of 6500 gals. The two power units use No. 208 standard Diesel fuel at a rate of 500 gals. every 24 hours. The suction pump is connected to its power unit by a matched set of 11 No. 300D Gates V-belt flats, and the Typhoon

(Continued on page 77)

Discharge pipe at left from 10-in. dredge pump hooked up to Diesel engine by V-belt drive. In the background is another Diesel engine which operates swing and hoist mechanism and also 8-in. jetting pump; to the right is jet pipe

In the center, background, may be seen 240-hp. Diesel engine which drives dredge pump; pump in center, foreground, supplies water for back face plate and stuffing gland of 10-in pump

Increase Production 300 Percent

John Jeffrey, Jackson, Mich., uses both hammermill and rolls to get maximum production of agricultural limestone

John Jeffrey

IN March, 1944, John Jeffrey purchased an agricultural limestone plant near Jackson, Mich., and promptly made changes which have boosted production about three-fold. This plant now produces road stone as well as agricultural limestone in a very compact and efficient setup. Although in the smaller producer category, production of 200 tons per day has been sufficient to serve customers in four counties around Jackson.

A 25-acre tract is available for quarrying, consisting of a 16-ft. layer of 95 percent $CaCO_3$ limestone, with the upper 4 ft. a seamed stone and the lower 12 ft. solid. Overburden, averaging about 7 ft. in thickness, is removed by a 60-hp. Caterpillar tractor with bulldozer attachment, and is wasted into a previously worked-out area.

Drilling-Blasting Practices

Holes are drilled by a Sullivan wagon drill, powered by a 160-ft. Ingersoll-Rand air compressor, at a rate of about 1 ft. per min. Spaced at 4-ft. centers with a 4-ft. burden, the holes are started at 2 in. and taper to 1¾ in., drilled to the full 16-ft. depth of the deposit.

Holes are charged with 1½-in., 60 percent, duPont Gelex at about 12 lb. per hole. This amount of dynamite yields about 20 tons of stone per hole, 20 holes constituting the average shot. The stone is broken up to about a top size of 8 in., which practically eliminates secondary shooting.

Crushing and Screening

Stone loaded onto 3-cu. yd. International trucks by a 1-cu. yd. gas-powered Northwest crane, is hauled to the crushing plant about ⅛ mile distant. Trucks dump the stone into a feeder hopper which sends it to a 24-in. Jeffrey flight conveyor, 30 ft. centers, for discharge into a XXXB Gruendler hammermill. The mill, set to crush to a top size of 1 in., discharges to a bucket elevator, 40 ft. centers, which moves the stone to a 3- x 6-ft. double-deck Simplicity vibrating screen. The top deck has ½-in. square openings and the lower deck ⅛- x ⅜-in. openings. Oversize is chuted to a 10-ton capacity bin as concrete aggregate. Passing the top deck and retained on the lower it is chuted to a 12- x 16-in. Bonded Scale Co. roll crusher or to a 25-ton capacity bin for road stone. Passing the lower deck drops directly into a 40-ton capacity bin as agstone.

Stone is sent to the rolls when a greater amount of agstone is desired. The rolls, spaced at ⅛ in., receive about 5 tons per hr., which is the average amount retained on the lower deck of the screen. From the rolls, the stone returns to the screens via a bucket elevator, 35 ft. centers.

When the bins are full, stone is stockpiled by a 1½-ton International truck. For loading from the stockpiles, a Nelson truck loader or a Northwest crane with a 1-cu. yd. clamshell bucket is used.

Right: Wagon drill which drills 2-in. holes, 16 ft. deep, at the rate of one foot per minute

Below: Shovel loading truck for haulage to primary crusher. Note the very thoroughly fragmented rock in quarry

Over-all view of plant with primary crusher to the left. Stone is dumped into hopper which feeds 24-in. flight conveyor for discharge into hammermill

The Jeffrey Lime Co. has had considerable success in making moving parts last longer by the application of Lincoln Manganweld hard-surfacing rods. Hammers on the mill are hard-surfaced about every five weeks with a ¾-in. layer, and have been in use almost two years. This company feels that a very substantial saving has been effected by this method of maintenance.

Power for the various units in the plant is as follows: The hammermill has an 80-hp. International Diesel which also powers the first bucket elevator; the screens have a 3-hp. Westinghouse electric motor; the smaller bucket elevator uses a ¾-hp. Westinghouse electric motor; the roll crusher has a 20-hp. Wisconsin air-cooled gas motor with six V-belt drives; and the flight conveyor uses a converted Model A Ford motor. The drive belt which operates the hammermill is an endless 10-in. Goodyear Compass-Cord belt, which, the superintendent claims, is guaranteed not to stretch.

Agstone is sold on A.A.A. county contracts and is delivered to the farm by privately-owned spreaders. All haulage from the plant is on a contract basis with local trucking concerns.

Merge Lumnite with Universal

THE ATLAS LUMNITE CEMENT CO., has been merged into the Universal Atlas Cement Co., New York, N. Y. Effective July 1, the organization of the former Atlas Lumnite Cement Co., will be known as the Lumnite Division, Universal Atlas Cement Co., with headquarters in New York City. Manufacture and sale of Lumnite, a special hydraulic cement widely used for industrial purposes, will be continued under the direction of Joshua L. Miner, vice-president, Lumnite Division.

Dredging

(Continued from page 74)

pump is connected by flat-belt drive. The jetting pump is direct-connected to its power unit.

The deposit varies in thickness from 35 to 60 ft. with an average overburden of 25 ft., which is pumped together with the deposit to a preliminary screening station. Since the deposit does not break down readily by pumping, it has been found necessary to shoot the bank. From 50 to 80 sticks of 40-percent dynamite are lowered into the pond next to the bank and shot. An average of one carload of material can be loosened with 10 sticks.

Relay Screening Station

The preliminary screening, or relay, station is located about 700 ft. from the new dredge and about 300 ft. from the main plant. The fundamental purpose of rehandling the material at this station is to wash off the excess clay and silt, which purpose is achieved by stockpiling the sand and gravel under water at the relay station. The solids are picked up by another pump and sent to the main screening plant.

The product pumped from the pit discharges over a 9- x 12-ft. gravity screen with ⅜-in. sq. openings, oversize dropping to the under-water stockpile, and sand passing the screen, laundering to a 6-cu. yd. sand box. Discharge from the sand box is through two 4- x 4-in. sq. openings at the side of the box into the pit, joining the gravel in the stockpile. Overflow from the box is laundered to an area about 300 ft. distant, where the waste and excess fines are pumped to a disposal area 1600 ft. away from the plant by a 10-in. Type H Amsco pump.

Sand and gravel in the stockpile is reclaimed by a 10-in. Type O Amsco pump and pumped to the main plant with the assistance of an 8-in. Type 32 Amsco booster pump, located midway in the line. Flow of solids through the line has been doubled with the assistance of the booster pump, according to the superintendent.

Main Screening Plant

The product from the stockpile is received at the top of the main plant in an old Type H pump shell that breaks the velocity of the flow and sends the aggregate over a spreader table, 7 ft. long, 6 ft. wide at the feed end, and 20 ft. wide at the discharge end. From the table, it passes over a 20- x 20-ft. gravity scalping screen with 1½-in. sq. openings where the very small percentage of oversize is removed and sent into a waste bin. Under the scalping screen are three 9- x 20-ft. gravity screens in series, one slightly in advance and below the previous one. Square openings on the three screens are ⅜-, ⅝-, and ¾-in., respectively. Three sizes of gravel are obtained with this screening process, and the product passing the ⅜-in. screen is laundered to a 60-cu. yd., two-compartment sand box for recovery of concrete and masons' sand. Above the first compartment is screen cloth with ⅛-in. sq. openings for recovering masons' sand and above the second compartment is screen cloth with ¼-in. sq. openings for collecting concrete sand. When more fines are desired in the concrete sand, a plate is placed over the top of the masons' sand box, sending the entire flow over the second compartment. Overflow from the box launders to waste in the pit. Each compartment is equipped with six 2-in. pipes for bottom-discharge to railroad cars.

When a specification gravel is produced, the produce is drawn from the bins through side discharge and sent over a 4- x 10-ft. double-deck Niagara vibrating screen, equipped with the openings necessary to produce the type of aggregate desired. Product from the screen drops directly to railroad cars on either of two tracks below. There are four spur tracks at the plant to handle production.

H. H. Holloway is owner of the Rapides Gravel Co., C. F. Akins is manager, and E. W. Jenkins is plant superintendent.

Cement Shortage May Cut Michigan Road Program

REPORTS from Michigan indicate that the State Highway Department may defer new construction until next year due to the "shortage" of cement. It is reported that one Michigan cement plant with a production capacity of 3000 bbl. of cement has an 8000 bbl. per day demand. Retail outlets in the Saginaw area are said to be on reduced quotas.

Quarry Safety Awards

OUTSTANDING safety records for 1945 were made by six mines and quarries which were awarded "Sentinels of Safety" trophies in the national competition sponsored by the Bureau of Mines. A total of 74 mines and quarries also were awarded Certificates of Honorable Mention for working 30,000 or more man-hours without an accident. The Bridgeport limestone quarry, Bethlehem Steel Co., Bridgeport, Penn., won the trophy in the stone quarry division for working 379,948 man-hours without a lost-time accident. Records established by other companies operating nonmetallic mines or quarries are as follows:

Nonmetallic-Mineral Mines

Akron gypsum mine, Akron, Genesee County, N. Y., National Gypsum Co.

Sugar Creek limestone mine, Independence, Jackson County, Mo., Missouri Portland Cement Co.

Clarence Center gypsum mine, Clarence Center, Erie County, N. Y., National Gypsum Co.

Crestmore limestone mine, Riverside, Riverside County, Calif., Riverside Cement Co.

Crystal City silica mine, Crystal City, Jefferson County, Mo., Pittsburgh Plate Glass Co.

Quarries

Bessemer limestone quarry, Bessemer, Lawrence County, Penn., Bessemer Limestone & Cement Co.

Billmeyer dolomite quarry, Bainbridge, Lancaster County, Penn., The J. E. Baker Co.

Bethlehem limestone quarry, Bethlehem, Northampton County, Penn., Bethlehem Steel Co.

Security limestone quarry, Hagerstown, Washington County, Md., North American Cement Corp.

Ohio dolomite quarry, Millersville, Sandusky County, Ohio, The J. E. Baker Co.

St. Stephens limestone quarry, Jackson, Washington County, Ala., Lone Star Cement Corp.

Birmingham limestone quarry, Tarrant, Jefferson County, Ala., Lehigh Portland Cement Co.

Hudson limestone quarry, Hudson, Columbia County, N. Y., Universal Atlas Cement Co.

Walford limestone quarry, Hillsville, Lawrence County, Penn., Lake Erie Limestone Co.

Martinsburg limestone quarry, Martinsburg, Berkeley County, W. Va., North American Cement Corp.

Northampton cement rock quarry, Northampton, Northampton County, Penn., Universal Atlas Cement Co.

Oglesby limestone quarry, Oglesby, La Salle County, Ill., Marquette Cement Manufacturing Co.

Inwood limestone quarry, Inwood, Berkeley County, W. Va., The J. E. Baker Co.

Fordwick Gay limestone and shale quarry, Fordwick, Augusta County, Va., Lehigh Portland Cement Co.

Petoskey limestone quarry, Petoskey, Emmet County, Mich., Petoskey Portland Cement Co.

Margerum limestone quarry, Margerum, Colbert County, Ala., Alabama Asphaltic Limestone Co.

Fogelsville limestone-cement-rock quarry, Fogelsville, Lehigh County, Penn., Lehigh Portland Cement Co.

Marquette limestone quarry, Cape Girardeau, Cape Girardeau County, Mo., Marquette Cement Manufacturing Co.

Oglesby limestone quarry, Oglesby, La Salle County, Ill., Lehigh Portland Cement Co.

Birmingham limestone quarry, Birmingham, Jefferson County, Ala., Lone Star Cement Corp.

No. 3 cement-rock quarry, Coplay, Lehigh County, Penn., Coplay Cement Manufacturing Co.

Blue Mount trap-rock quarry, White Hall, Baltimore County, Md., The J. E. Baker Co.

White Haven sandstone quarry, White Haven, Luzerne County, Penn., The General Crushed Stone Co.

Iola limestone and shale quarry, Iola, Allen County, Kans., Lehigh Portland Cement Co.

Ft. Bellefontaine limestone quarry, St. Louis, St. Louis County, Mo., Missouri Portland Cement Co.

Martins Creek limestone quarry, Martins Creek, Northampton County, Penn., Alpha Portland Cement Co.

Greencastle limestone quarry, Greencastle, Putnam County, Ind., Lone Star Cement Corp.

Sylvania limestone quarry, Sylvania, Lucas County, Ohio, Medusa Portland Cement Co.

Mason City limestone quarry, Mason City, Cerro Gordo County, Iowa, Lehigh Portland Cement Co.

Catskill limestone quarry, Cementon, Greene County, N. Y., Alpha Portland Cement Co.

Oro Grande limestone quarry, Oro Grande, San Bernardino County, Calif., Riverside Cement Co.

Auburn limestone quarry, Auburn, Cayuga County, N. Y., The General Crushed Stone Co.

Fort Worth limestone quarry, Fort Worth, Tarrant County, Texas, Trinity Portland Cement Co.

Jordanville limestone quarry, Jordanville, Herkimer County, N. Y., The General Crushed Stone Co.

Thomaston limestone quarry, Thomaston, Knox County, Maine, Lawrence Portland Cement Co.

Genoa limestone quarry, Genoa, Ottawa County, Ohio, U. S. Gypsum Co.

Thomasville limestone quarry, Thomasville, York County, Penn., The J. E. Baker Co.

Alsen limestone quarry, Alsen, Greene County, N. Y., Lehigh Portland Cement Co.

Sandt's Eddy cement-rock quarry, Easton, Northampton County, Penn., Lehigh Portland Cement Co.

Dallas limestone quarry, Dallas, Dallas County, Texas, Lone Star Cement Corp.

Evansville cement-rock quarry, Evansville, Berks County, Penn., Allentown Portland Cement Co.

Hercules cement-rock quarry, Stockertown, Northampton County, Penn., Hercules Cement Corp.

No. 4 trap-rock quarry, Knippa, Uvalde County, Texas, Southwest Stone Co.

Union Bridge limestone quarry, Union Bridge, Frederick and Carroll Counties, Md., Lehigh Portland Cement Co.

Diamond limestone and shale quarry, Middle Branch, Stark County, Ohio, The Diamond Portland Cement Co.

National City gypsum quarry, National City, Iosco County, Mich., National Gypsum Co.

Folsom State granite quarry, Folsom, Sacramento County, Calif., Folsom State Prison Quarry.

New Guide Specification

STANTON WALKER, director of engineering, National Sand and Gravel Association, recently called attention of the membership to a recently revised "Guide Specifications" prepared by the Office of the Chief of Engineering of the War Department under date of March 13, 1946. These supersede guide specifications issued August 1, 1944. Several important changes are noted. While air entrainment in concrete is not mandatory, if an air-entraining admixture or cement is not used, reasons must be given. The type of air-entraining admixture must be approved by the Chief of Engineers. Another change is that the requirement for the soundness test has been modified. The 1944 specification required the fine and coarse aggregates to have a loss of not more than 8 percent in five cycles of the magnesium sulfate test, with the supplementary provision that aggregates failing to pass the test might be used provided a satisfactory service record could be demonstrated. The revised specification establishes no specific limitation on soundness. It says that "suitable tests and the service record will be used to determine the acceptability." It then provides that if suitable tests and a service record are not available, "as in the case of newly operated sources," the aggregate "shall be subjected to such tests as are necessary to determine its acceptability for use in concrete for the proposed structures."

The fine aggregate grading remains unchanged, still requiring a minimum of 12 percent passing the No. 50 and 3.5 percent passing the No. 100, with the additional requirement that the fineness modulus shall be not less than 2.4 or more than 2.9 and that "at least 9 of 10 test samples of the fine aggregate as delivered to the mixer shall not vary more than 0.10 from the average fineness modulus." However, an important change has been made which clarifies what was probably the intent of the original specification. It is provided that "at the option of the contractor, fine aggregate may be separated into two or more sizes or classifications, . . ."

For the coarse aggregate the grading requirements have been considerably clarified and conform substantially, not exactly, to Simplified Practice Recommendations. Four sizes are specified as follows:

Sieve Size	Percent by Weight Passing Individual Sieves			
U.S. Std. Sq. Mesh	No. 4 to ¾"	¾" to 1½"	1½" to 3"	3" to 6"
7"	–	–	–	100
6"	–	–	–	90–100
3"	–	–	90–100	0–15
2"	–	–	20–55	0–5
1½"	–	90–100	0–10	–
1"	–	20–45	0–5	–
¾"	90–100	0–10	–	–
⅜"	30–55	0–5	–	–
No. 4	0–5	–	–	–

LABOR RELATION TRENDS

By NATHAN C. ROCKWOOD

WITH this article starts a monthly page in ROCK PRODUCTS devoted to a phase of national labor relations developments which are considered of the most general interest. The field covered is a broad one, and obviously it could be analyzed or summarized from many angles. Our purpose here is to read through the many current rulings and court decisions on interpretations of the National Labor Relations Act (the so-called Wagner Act), the Fair Labor Standards Act (the so-called wage and hour law), the Public Contracts Act, the Selective Training and Service Act, in so far as it relates to employment of ex-servicemen, and the rulings of the National Wage Stabilization Board.

Many of the cases presented for rulings and court decisions appear trivial, and are of no particular interest to anyone except those directly involved. Studied as a whole, and correctly interpreted, however, they are of very great interest and significance because they portray conditions and trends which face every employer and employee alike, both as such and as citizens of the United States. The inevitable conclusion from a study of the record to date is that an immense amount of money, time, energy and patience has been expended in arriving at the "awards" (rulings) and court decisions; and to the layman these are valuable and helpful only if we can fathom the meaning of them as a whole.

Background

The most controversial labor legislation is, of course, the National Labor Relations Act of 1935. It was written by ardent social welfare workers (or experts?) to forestall all the obstacles that management in many instances had used to prevent bona fide collective bargaining by labor unions. Recent American industrial history provided plenty of detailed information. Hence the N.L.R.A. is chiefly a list of prohibitions for employers or management, and the implied assumption (whether by omission or intention) that labor unions can do no wrong.

Add to this origin the fact that the law has been administered by disciples of the same group who wrote it, and that these administrators have often been prosecutor, judge and jury, and it is not difficult to understand the bias that is evident in many rulings. It will be well for the consistent reader of this page to keep that in mind. Revision of the law to reëstablish the rights of employers may be highly desirable, but it is not absolutely necessary, because it is within the capacity of Board members or their employees to accomplish the same results by judicial character and performance.

Experience Helps

The trend of rulings in the recent past seems to be slightly in the direction of more recognition for the rights of employers, and of learning from experience that there can be considerable skulduggery on the part of labor union officials as well as on the part of management. Since most intelligent people desire to be fair, errors may arise from excessive zeal for a cause as well as from downright cussedness. Those who consider themselves victims of bias against management may either help to educate the N.L.R.B. members, employees, examiners, arbitrators, etc., or fight the officials as well as the law, with the hope of its revision.

Firing Difficult

Among the commonest cases during the past month are those which illustrate the difficulty an employer now has in getting rid of an undesirable employee if he or she is a member of a union which has a contract with the employer. The condition arises from the many prohibitions on "employer interference" and against "discrimination"; of course, this is not new, but it is of current interest because some industries are beginning to apply a measure of selection in their employment practice. However, in an Ohio paper plant case, a U. S. Conciliation Service arbitrator awarded the employee reinstatement with back pay and full seniority, who had not returned to work, after he had reported his inability to meet his shift deadline, as required by his union's contract with the employer. There was no contention that he had been discriminated against because he was a union man, merely an allegation that he had been unjustly fired.

A Pennsylvania steel manufacturer attempted to demote a cranesman accused of "soldiering" on the job, which was stocking an open-hearth furnace with brick, obviously, a "bottle-neck" job. His union succeeded in convincing the majority of a board of arbitration that the failure to deliver was caused by inadequate crane service (trucks to move the brick), and the cranesman was ordered reinstated with an admonition to soldier no more, and one to the employer to provide more crane service.

On the other hand, an Ohio car-wheel manufacturer was sustained by a U. S. Conciliation Service arbitrator in firing an employee who left his post and brought intoxicating liquor into the plant. The union attempted to defend him on the ground that the company had posted no rules specifically prohibiting this offense, which the employee himself denied having committed. The testimony refuted his denial, and since it could not be shown that the management had allowed other violations, and hence as there was no discrimination, the employee stayed fired.

These are typical cases in which there was no claim against management of discrimination because of union membership. They merely illustrate how far union officials will go to keep a member from being fired for any cause whatsoever. They emphasize the necessity of keeping accurate records of the performance of all employees so that it can be proved beyond all doubt that when they are released from the payroll it is for good and sufficient cause. It appears that the net effect will not particularly benefit the average employee, but will eventually make for more efficient organizations.

Seniority Difficulties

Determination of the seniority status and method of promoting employees to better jobs is an ever-present problem, now complicated by the job and seniority status of ex-servicemen, guaranteed by the Selective Training and Service Act; if they apply for reinstatement within 90 days of discharge from the services. A typical case not complicated by union contract or union membership was that decided August 9, 1946, by the U. S. District Court of Middle District of Pennsylvania.

The petitioner for his G.I. rights had prior to his enlistment been manager of a retail store at $50 per week. During his absence a woman was appointed in his place, whose salary had become $55 per week. The ex-G.I. did not immediately apply to get his job back, but did so within the legal time limit. His ex-employer offered to re-employ him as a "floor manager" at $50 a week, but would not fire the new woman manager in order to give him his old job. The court ordered the ex-G.I. reinstated as manager at $55 per week, plus back pay at that rate from the time of his application. The U. S. District Court, Northern District of Georgia, in a case decided July 15, 1946, held that an ex-serviceman waived his right to reinstatement in his old job because he had previously accepted but did not keep another job elsewhere at a higher salary than his old one.

A veteran who had been branch manager for a roofing company was held entitled to the very same job, even when offered as good a position as the manager of a branch in another locality. This decision was made by the U. S. District Court, Middle District of Alabama. The case was par-

(Continued on page 87)

What Becomes of a

TEN-MILE CONVEYOR BELT

World's longest conveyor belt which carried 12,000,000 tons of aggregates for Shasta Dam, continues in service with sections sold to plants as far as South Africa

WHAT becomes of a ten-mile conveyor belt? Just before the war a rubber conveyor belt began transporting 12,000,000 tons of concrete aggregate from Columbia Construction Company's plant in Redding, Calif., to the site of Shasta Dam—a distance of 9.6 miles. The 36-in. belt, which carried aggregates ranging in size from sand to 6-in. rock, traveled over mountain terrain at the rate of 570 f.p.m. and moved 1,170 tons of material per hour.

When the United States Bureau of Reclamation ran its preliminary surveys for Shasta Dam, the nearest adequate gravel deposits were found in the bed of the Sacramento River, approximately ten air-miles from the dam site. It was finally agreed that a belt conveyor would be more satisfactory for this transportation project than either a truck or rail haul. Articles appearing in ROCK PRODUCTS have described in detail its operation and the considerations which decided the selection by Henry J. Kaiser and his associates of this unusual belt conveyor installation. The General Electric Co. supplied the inter-locking control for the electrical drive machinery; the Goodyear Tire & Rubber Co. provided the conveyor belting; Chain Belt Co. turned out the 14,000 roller-bearing troughing rolls and 4,500 return idlers; and Link Belt Co. produced some 156 conveyor pulleys, ranging from 30- to 48-in. diameter with shaft diameters from 2-3/16 in. to 5-15/16 in.

The shortest conveyor flight of the system was approximately 800 ft. between head and tail pulleys while the longest unit ran over 3,400 ft. With the long flights, steep inclines and high tonnage requirements, Goodyear designed a high speed belt of great flex-life and adhesion, together with a 3,500-4,000 lb. tensile and 20-24 lb. friction. They developed a special duck from long staple Pima cotton, enclosing each ply in a skim coat of rubber and built a special breaker fabric into the top rubber. They were able to use genuine pre-war rubber throughout with a 3/16-in. top and 1/16-in. bottom. All this was made into a belt not over 9/16-in. thick with a duck weight of only 42 ounces.

Haul 12,000,000 Tons

In four years the conveyor carried over 12,000,000 tons of sand and rock out to the bunkers at the dam site. In spite of the fears many people had in the beginning, the ten-mile conveyor operated comparatively smoothly. Three operators ran the 26 drive stations, a dispatcher was stationed at the Shasta end and a loaderman at the gravel plant. The maintenance crew consisted of a mechanic, two helpers and an oiler. It was the paramount duty of the maintenance crew to *prevent* breakdowns that might hold up the whole schedule of construction at the dam. As a result, the conveyor idlers and other equipment remained in exceptionally good condition.

An accident occurred very early in the project. Four of the conveyor sections were downhill flights. On the steepest slope, which reached 24.5 percent, a sharp piece of steel chute liner fell on the belt, cutting off about three inches of width along the entire length of the belt before the unit could be stopped. The cut edge was peeled off like an apple paring over 5,000 ft. long. In spite of this belt being so much narrower than the 36-in. width of the remaining units, it was necessary to keep this belt in operation. Actually it outlasted the whole job along with the other belt sections. It has since been sold to the Glacier Sand & Gravel Co., in the State of Washington, for continued operation.

Sell Belt Sections as Far as Africa

Upon the completion of Shasta Dam, the conveyor was dismantled, the belts were cut into lengths from 1000 ft. to 1300 ft. long and stored in rolls at the gravel plant in Redding. A two-foot piece was cut from each of the 26 flights and sent to the Goodyear laboratories at Akron, Ohio. Here they ran complete tests to see just how their special long-haul belting had stood up. Results showed adhesion, flex life and duck strength of the used belts to be practically at the original value—95 percent to 100 percent. Cover wear was negligible, amounting to approximately 1/32 in. All belts had pulled down to approximately 35-in. width, which is the expected normal amount; however, edge wear was not apparent on most of the belts, excepting of course, the flight which suffered the 3-in. cut and one or two other flights which received some wear before the belts were trained. Cover coating consisted of small cuts, many extending into the breaker fabric, though adhesion of cover to breaker and breaker to carcass is still as high as the best G.R.S. belts today.

Columbia Construction Co., having no new projects to start, put the belt on the market, together with idlers, pulleys and drives, and in the year and a half since the Shasta Dam job terminated, practically all of the original 120,000 ft. of belting has been sold for use on other operations. Firms have bought the belt and shipped it to Michigan, New York and New Orleans. A large shipment has been sent to the Union of South Africa where it is now operating in the gold fields. Another shipment went to Rhodesia.

Just a few weeks before the atom bomb hastened the end of the war, the Army Air Force was getting under way with the huge $20,000,000 improvement of runways and aprons at the Fairfield-Suisun Army Airbase, located halfway between San Francisco and Sacramento, Calif. The job (described in ROCK PRODUCTS, December, 1945) was not halted with the end of the war because Fairfield-Suisun is a permanent installation. Specifications called for more than a million tons of rock which had been produced quickly to meet the demands of the contract. Some of the crushers, screens and bins were purchased new on a high priority for immediate delivery. The nineteen conveyors were, for the most part, fabricated from the ten-mile belt conveyor system from Shasta Dam. These conveyors are now handling a production of about 750 tons per hour on a 24-hr. daily operating schedule.

Sections of the belt also have been sold to several mining firms in this country, as well as abroad, while other shipments have gone to sand and gravel plants, lumber companies, and to contractors for heavy construction jobs.

Aggregate plant of Columbia Construction Co., at Redding, Calif. Ten-mile conveyor in foreground (starting point)

Shasta Dam excavation upstream, to right. Batching plant and end of long conveyor, upper right

Using Low Grade Coal Without Affecting Clinker Quality

Deprived of foreign importations of high-calorie coal Spain has successfully used low-grade coals available in the country

By JOSE FERRER-VIDAL LLAURADO*

• With higher prices for domestic coal in the United States, cement and lime companies using large tonnages of fuel may be faced with the necessity of firing kilns with lower grade coals. The experience of Spanish cement companies in burning coals with ash content from 35 to 45 percent and a heat value of only 5000 calories should be of interest.

DURING the recent World War and for a considerable period thereafter Spain will be forced to use relatively poor grade native coals. The problem therefore will be to get the maximum efficiency from kilns and coolers using this inferior coal. Most of the kilns in Spain are of the common type, with the clinker discharging from the hood into an independently operated cooler below. However, there are some installations of Lepol kilns and other of the more modern type made by Smidth (Denmark) and Krupp with special multiple cooler installations, and also the Allis-Chalmers cooler.

Most of the coals used during the war in Spain were the so-called flotation fines from the Asturias coal mines, anthracite fines from León and Ponferrada, and low-quality lignites high in ash. The Asturias fines have the following characteristics:

Volatile carbon....12 to 18 percent
Fixed carbon.....30 to 50 percent
Ash .....35 to 45 percent
Heat value .....5000 calories

Coal Drying Problem

The first trouble encountered in drying this coal was due to its fineness and high water content which made it stick to the dryers. If "Atritor" or Raymond mills are used, where hot air can be employed for drying during grinding, the only trouble was the draft aggravated by the small volume of material to be ground, causing premature wear. It was found advisable to dry the material to contain not over 1.5 percent water when it leaves the mill.

Due to its low heat value, a larger volume of the fuel is required. This means that a greater amount of primary air also will have to be used, but at a temperature not quite as high as with better quality fuel because its high ash content makes it more dense. The greater degree of diffusion would prevent the air from conveying the volume of coal to be injected and it would be partly deposited in the pipes and the kiln could not function properly. Therefore comparatively cold air must be used which cools off the kiln, and makes the production of good quality clinker quite difficult. The clinkerization zone would be pushed towards the interior of the kiln, resulting in low output.

Another factor affecting kiln production is the high ash content of this fuel. Due to decreased draft, the fuel remains longer in the kiln, and the ash is absorbed in the clinker, increasing its percentage of acid elements. It is therefore necessary to increase the carbonates by introducing a hard-burning material to the kiln which requires more fuel, although this in turn will result in more ash and a low-quality clinker.

Must Reduce Primary Air Volume

The first step to increase the temperature of the kiln and obtain maximum use of the heat values of this low grade fuel is to reduce to a minimum the amount of primary air which cools off the kiln. To this end, another method of injecting the coal must be employed. If an emulsion could be prepared by some mechanical means, consisting of hot air and coal, as in the case of the intimate mixture of two liquids, and inject it in the combustion zone, perfect combustion of the coal could be obtained even though the coal would not have good burning properties. However, an emulsion thus made would not remain in this state due to the density difference of its components, the coal rapidly separating from its suspension medium.

To create this emulsion, very dense air must be used; that is, cold air or refrigerated, if possible, but a minimum amount should be used, just enough to make a good emulsion with the fuel and insure its complete conveyance into the combustion chamber. To do this, the fans blowing in primary air should be replaced with others of smaller capacity. To obtain a good mixture and insure its dispersion with a small amount of air, the larger injection pipes conveying lukewarm air (200 deg. C.) could not be used if the formation of sediments is to be prevented. The pulverized coal also could not be dropped in the path of the air blast. It would be necessary to use air under a certain predetermined pressure and a simple mixing device would have to be employed to obtain a homogeneous mixture with the minimum amount of air required to convey it a sufficient distance within the kiln.

Under normal conditions, the coal-air mixture thus prepared encounters a high temperature (800 deg.) within the kiln from the secondary air coming from the cooler. The coal emulsified in a small amount of cool air burns readily despite its low volatile matter content and its high percentage of ash.

Therefore, high pressure and small capacity must be used, varying according to the kiln dimensions. The best pressures are from 30 to 80 cms. water column, with a capacity of from 15 to 50 m. per minute. The mixer may consist of a casing or jacket of cast iron or sheet metal electrically welded, enclosing a detachable nozzle through which the pulverized coal is injected. A turbulent mixture is created in its passage through the injection pipe into the kiln burner. Nozzle dimensions and the required pressure should be given careful consideration in each particular case in relation to the volatile matter, ash, and water content and fineness of the ground coal. Fig. 1 illustrates difficulties encountered in burning low-grade fuel in kiln arranged to burn high-grade pulverized fuel. The primary air at low temperature occupies almost the entire combustion zone, obstructing the passage of the secondary hot air from the cooler. Fig. 2 shows a kiln arranged to burn low-grade fuel with a reduced volume of primary cool air,

*Abstracted from an article in Cement and Concrete, Barcelona, Spain.

permitting utilization of a larger volume of secondary hot air from the cooler.

It will be noted that the difficulties experienced with the so-called normal process of combustion to absorb the hot air from the cooler are not present in Fig. 2 as the interference between the two air blasts at different temperatures has been eliminated. In Fig. 2 a low volume blast of cold air and coal mixture is introduced into a large mass of hot air that envelops the cold air-coal mixture.

Increase Secondary Air Volume

Generally speaking, the primary air can be reduced 90 percent of that normally employed, provided proper nozzle and pressure are used to obtain a good mixture. To avoid admission of cold air in the kiln and cooler when forced draft is not available or when the coolers are small in size, it is advisable to blow air into the cooler. This will activate the kiln draft providing an ample volume of hot secondary air.

With this firing arrangement, combustion of the coal takes place as close to the lower end of the kiln as it may be desired, the calcination zone being restricted. The preparation zone is therefore longer and the output is increased.

There is no danger of the coal being blown over unburned as combustion starts at the very instant it enters the kiln. Consequently greater draft may be supplied by opening the stack damper. The greater the air volume drawn in the larger the combustion capacity. More fuel will be burned and this will result in increased output. This also permits the ash to be blown out of the kiln by the additional draft so that it is not absorbed by the raw materials and clinker, and the quality of the product is improved. This arrangement also makes it possible to use a smaller amount of carbonates thereby increasing output.

Another advantage claimed for this method of firing is the relocation of the calcination zone inside the kiln by merely replacing the nozzle, eliminating the formation of rings. It is also easier to fire the kiln by this method as a smaller amount of cold air is encountered and the admission of secondary air can be easily regulated by means of the stack damper. Explosions and annoying noises are also eliminated.

Based on actual experience in burning low-grade fuels with various kilns, the following conclusions can be drawn:

1. To burn a low-grade coal, it must be injected into the kiln with the least amount of primary air that will permit a perfect mixture. To this end, high pressure, small capacity fans and proper mixtures must be used.

2. The primary air must be cold to have the greatest mass in the least volume.

3. If the cooler is deficient in size, air must be blown through the end to avoid air leakage. In this way the amount of secondary hot air is increased.

4. It is suggested that the stack damper be opened as much as possible to blow ash out to prevent its absorption by raw material and clinker.

It is interesting to observe that the foregoing conclusions apply also to the so-called "adequate" fuels. Ease of combustion of these fuels implies a greater kiln combustion capacity, larger output, and less fuel consumption.

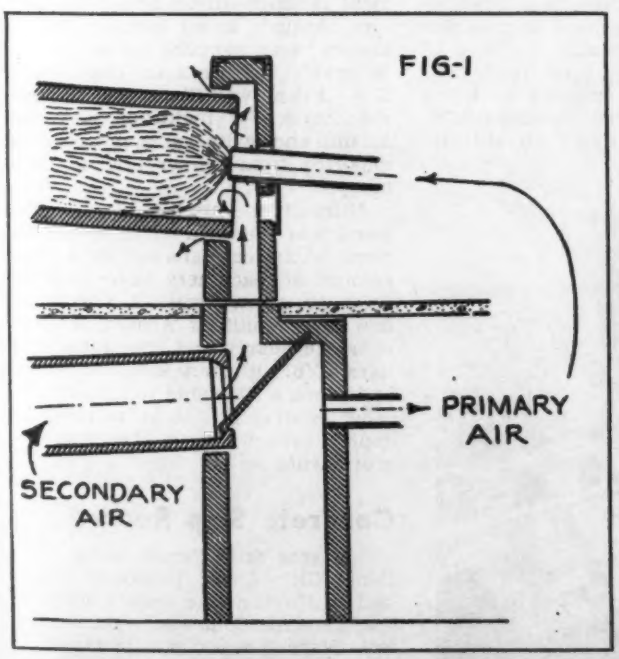
Perfect combustion of coal under these conditions makes it possible to burn fuel low in volatile matter or mixed with up to 20 percent anthracite fines with a considerable increase in heat value. When lignite is used, the percentage of anthracite can be increased provided the lignite is finely pulverized.

New Standards Books

AMERICAN SOCIETY FOR TESTING MATERIALS, Philadelphia, Penn., has announced the publication of the 1945 Supplement to the Society's Book of A.S.T.M. Standards which, under the biennial plan of publication, is issued in 1944. Of particular interest to ROCK PRODUCTS' readers is Part II on Nonmetallic Materials (Constructional). It has 250 pages covering 50 standards. Subjects include lime, filter block, glass, soils, refractories, fire brick, thermal insulating materials, roofing materials, etc. Copies of this supplement can be obtained from the society at $4 per copy.

Building Feldspar Plant

THE COLORADO FELDSPAR CO., subsidiary of the Consolidated Feldspar Corporation, has started construction of a large feldspar treating plant at Parkdale. It will cost about $500,000.



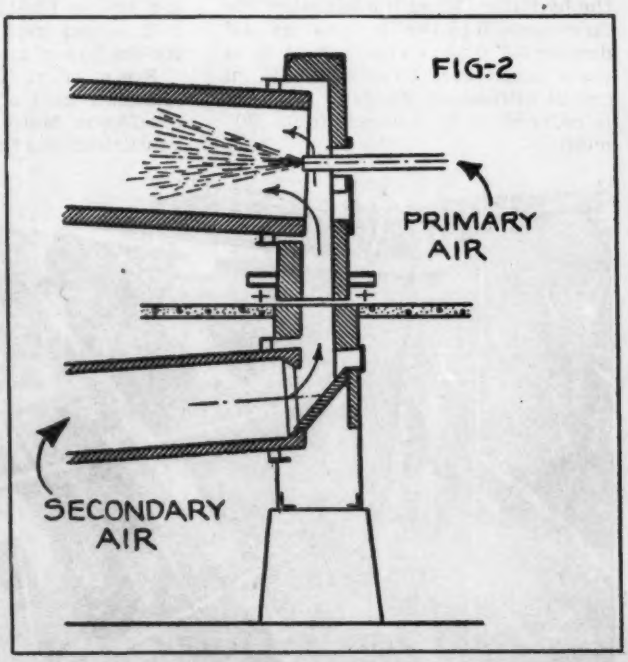
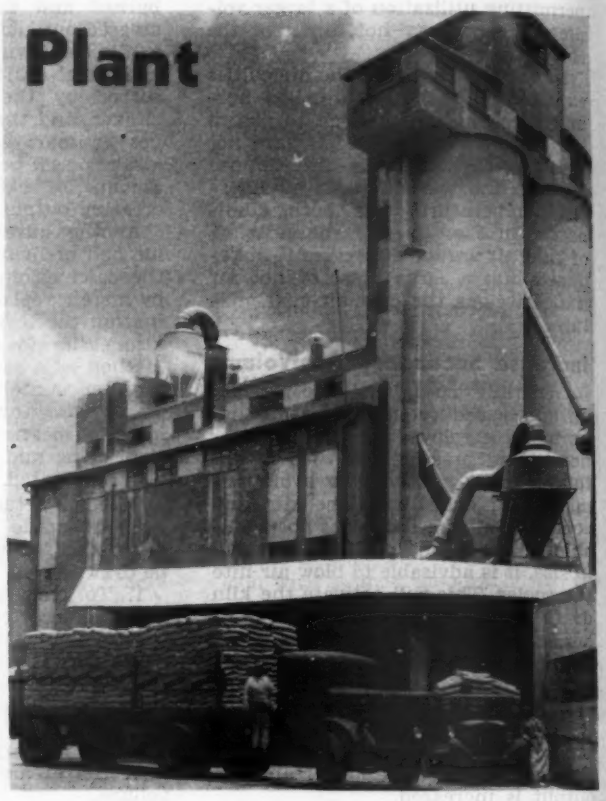


Fig. 1: Primary air at low temperature occupies nearly the entire combustion zone of the kiln obstructing the passage of the secondary hot air coming from the cooler. This produces interference between the two air blasts. Fig. 2: Shows kiln arranged to burn low-grade fuel with a reduced volume of primary cool air, permitting utilization of a larger volume of secondary hot air from the cooler

Largest Hydration Plant in Mexico

Calidra, S.A., produces 250 tons daily of hydrated lime at modern plant near Mexico City

By MANUEL REJON NUÑEZ



Loading platform with hydrating plant in background

ONE of the most modern lime hydrating plants in Mexico is operated by Calidra, S. A., at Col. Anahuac, Mexico City, Mexico. This plant, which was specially constructed for the production of Calidra, a quality brand of hydrated lime, has a daily production of 250 tons.

Constructed of reinforced concrete throughout, this interesting plant was designed, supervised and built under the direction of Felipe Garcia Piñuela and Carlos Maier, engineers. Lump quick lime is received at a railroad siding in box cars and trucked from an unloading platform to bins feeding a mill of German manufacture with a production of 15 tons an hour.

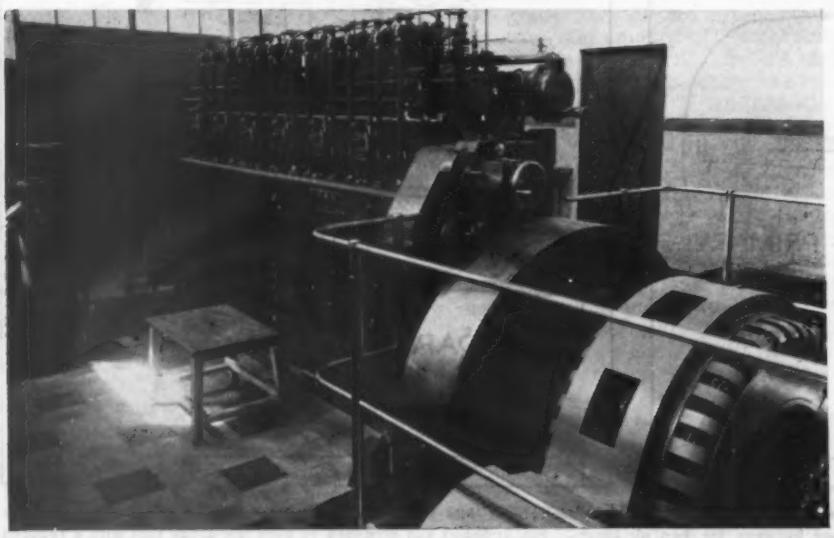
Crushed lime goes to the boot of a bucket elevator from which it is discharged into a surge bin feeding the hydrator. From the hydrator, the lime passes into two large curing and dewatering tanks. The hydrate from these tanks goes to a ball mill, in circuit with an air separator, where it is reduced to 95 percent minus 200 mesh.

The finely ground hydrated lime is elevated to the top of two concrete silos, each of which has a capacity of 350 tons, feeding two three-valve bagging machines. Each bagging machine has a capacity of 45 bags every 10 minutes. It will be noticed in looking at the illustrations that gravity is depended upon as much as possible for the flow of materials.

Every effort has been made to eliminate dust and improve working conditions. Many dust collectors and ventilators have been installed throughout the plant, the latest addition including a late model Rotoclone supplied by the American Air Filter Co.

A 200-hp. Diesel engine drives a generator supplying current for motors throughout the plant. All equipment is direct-driven by electric motors through speed reducer drives. Motors were supplied by A. E. G., Compañia Mexicana de Electricidad S. A. A deep-well Sterling pump supplies water for hydration purposes. All mill and hydration equipment was imported from Gerber Pfeiffer, Germany.

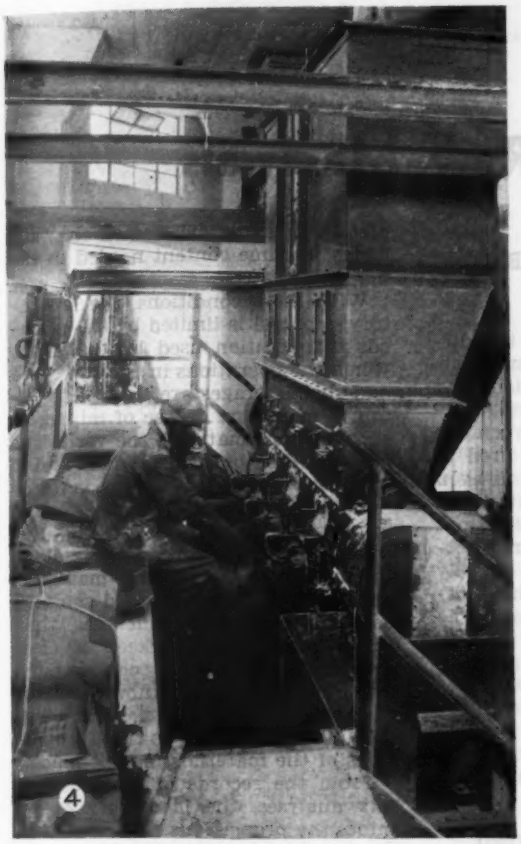
Although the original plant equipment was obtained from Germany, plant expansion plans call for a large amount of machinery to be supplied from American firms. A new plant now being built at Apazco, Mexico, near the quarry and lime kilns, will have a Vulcan rotary kiln, two Weber hydrators, a Raymond roller mill and other equipment. It is planned to double capacity with the new improvements.

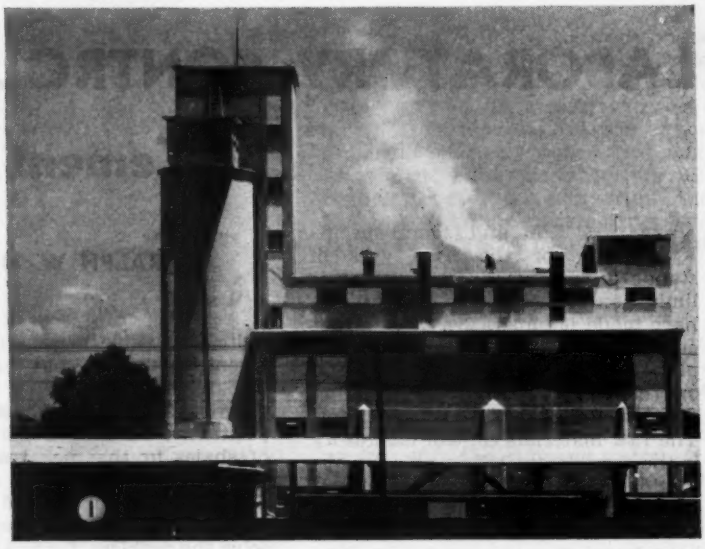


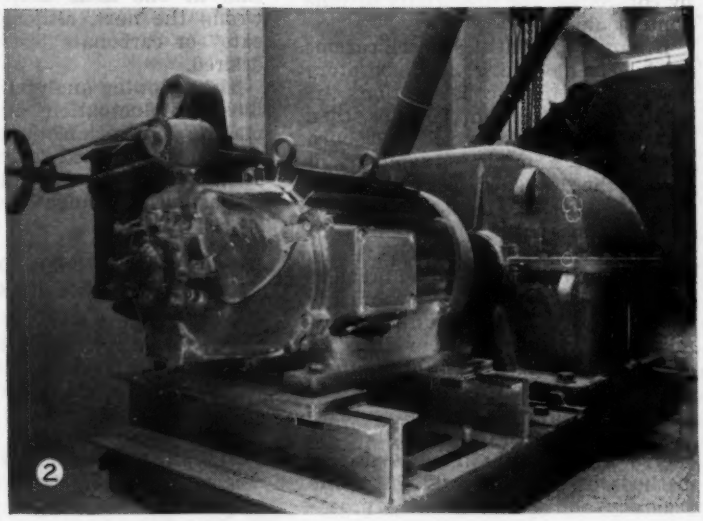
Diesel engine and generator which supplies electric power for all plant motors

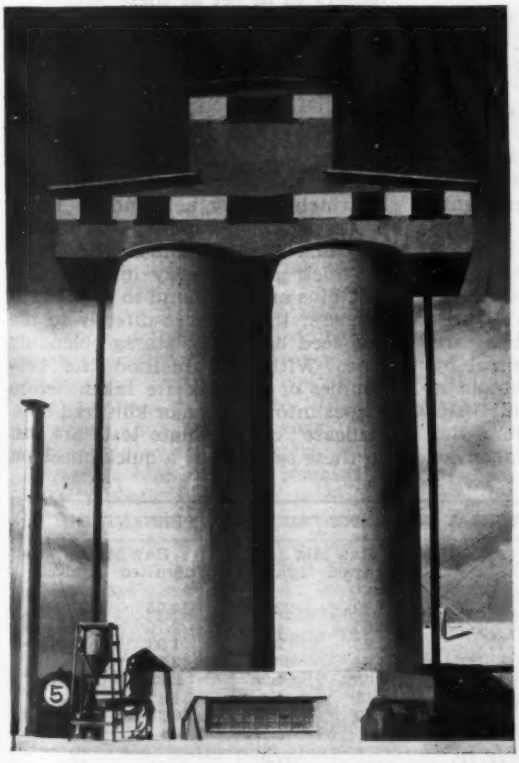
Concrete Ship Record

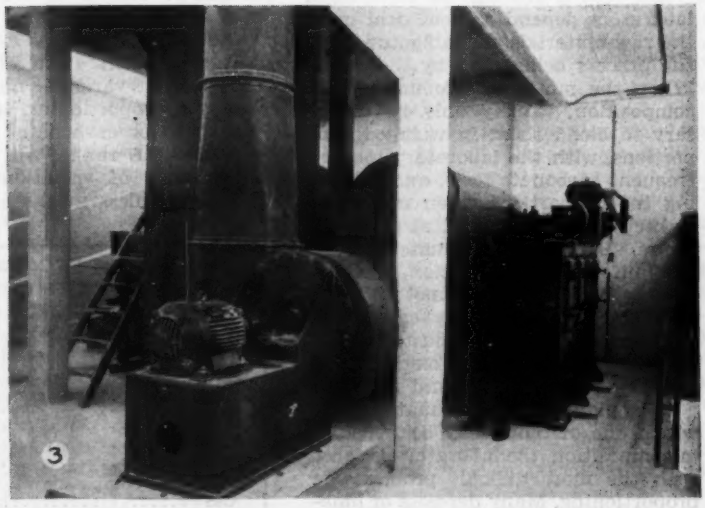
CONCRETE SHIP CONSTRUCTORS, National City, Calif., produced nearly half of the concrete vessels built for the Maritime Commission during the last War. The output included 22 tankers, 22 lighters, three refrigerated barges and two machine shop boats.











Views of Calidra lime hydrating plant. 1—Main building with unloading platform and railroad siding for handling raw materials; 2—Mill for grinding lime hydrate; 3—Main plant dust collector; 4—Three-valve bagging machine; 5—Unusual reinforced concrete storage bins for hydrated lime which is to be bagged

LABORATORY CONTROL of Cement Raw Materials

By RALPH W. HUBBS

NEW A. S. T. M. and federal specifications for the five types of standard portland cement, with their limitations on chemical composition, have made it imperative that an accurate control be maintained on the proportioning of raw materials, and on their flow through the grinding department, storage silos, and kilns. The raw materials control laboratory is the department responsible for obtaining this satisfactory chemical control of proportioning the materials, and in many instances it has been found that this cannot be done by controlling the uniformity of lime content alone.

Beginning with the specifications for a cement clinker, the laboratory must take into consideration the losses which occur in the kilns, then design a raw mix which will burn easily with a minimum amount of fuel to the desired clinker. With the present types of portland cements this may mean the proportioning of four raw materials; limestone, shale, iron ore, and silica, which will require considerable amount of laboratory control work to obtain a uniform raw mix flow at all times to the kilns. By a constant check on the proportions of each of these four materials the laboratory can vary the percentages of the oxides in the raw mix, but the degree of uniformity in materials and methods of operation will affect the accuracy and success of this procedure considerably.

The tests performed by the control laboratory depend a great deal upon the raw materials available and upon the process being used by the plant. When the materials are uniform in composition, it may only be necessary to blend them in weighed proportions, with the laboratory making frequent carbonate tests, and adjusting the proportions when necessary, to keep the lime content at a desired figure. But when the materials are not uniform in composition, the laboratory finds that it cannot obtain a satisfactory raw mix by controlling lime content alone, but must resort to more frequent complete oxide analyses of the rock and ground raw mix.

In a plant using raw materials of which one or more may be irregular in composition, the laboratory is faced with the more difficult problems of proportioning. Many deposits of limestone contain seams and dikes of shales, granites, quartz, etc., and when this rock is blasted down, it is quite impossible to separate the different impurities from the limestone. The result is a mixture which may vary considerably in chemical composition, even though the percentage of shales in the rock transferred to the storage bins is kept at an even figure. With this type of material it is found that weigher feeders do not solve the problem, for the correct setting at one hour may be entirely wrong the next, although the "silicate" or carbonate tests may be as desired.

The following analyses are given to illustrate fluctuations in raw mixes made from variable materials proportioned to a fixed "silicate" or lime content, the purpose being to secure a constant C_3S range between 64 and 69 per cent.

Intimate Mixing Essential for Variable Materials

As raw mix *A* was correct in oxide and potential compounds, no change was made in the proportions of rock for mix *B*, yet there was a considerable drop in the SiO_2 percentage, resulting in a mix much too high in C_3S. In Table 2, raw mix *C* was correct so again no change was made in the proportions of rock, and mix *D* was held to the same lime content as mix *C*. The result was an increase of 0.55 per cent unignited SiO_2, giving a C_3S below the limits desired.

It is evident from these figures that when variable materials are used for proportioning, a control by "silicates" or carbonates to obtain a constant C_3S range, will result in a wide range of variations from the constant, unless means are taken at certain times to check upon the "silicates" or lime content needed in the mix.

With these conditions, the laboratory's control is limited by the methods of operation used by the plant. When the operations in the limestone and shale storages are such as to obtain a maximum degree of mixing of each variable material, the variations are smoothed out considerably and it is then possible to use carbonate or "silicate" tests more freely as an aid in controlling the proportioning. But when no plan has been devised for the mixing of the variable materials, and they are only separated as much as possible into different bins, then the laboratory must keep a close watch on the quarry rock, for the important factor is to know when the type of rock does change, so that immediate corrections in the proportions of the materials may be made.

From the records of previous raw mix analyses, the laboratory determines the proportions of rock needed, then gives the orders for the weigher feeders to be set at these figures. If the plant does not use weigher feeders, then the laboratory gives the order for the rock to be drawn to a certain "silicate" or lime percentage.

When to Sample

After the rock leaves the proportioning point there are various ways in which it may be handled in the process of grinding it to a finished raw mix for the kilns. Ordinarily, the rock goes directly into the mill feed bins and is ground to the desired fineness; then it goes directly to the kiln feed bins or to storage blending silos. With this method the first samples of the mix are taken before it goes into the silos or kiln feed bins. "Silicate" or carbonate tests are run on these samples as a quick check on

TABLE 1: RAW MIXES WITH A CONSTANT "SILICATE" PERCENTAGE

	Raw Mix *A*		Raw Mix *B*	
Oxide Composition	Unignited	Ignited	Unignited	Ignited
SiO_2	14.79	22.46	14.05	21.44
Al_2O_3	2.66	4.04	2.76	4.21
Fe_2O_3	1.85	2.81	1.93	2.95
CaO	43.64	66.27	43.71	66.70
MgO	2.85	4.33	2.85	4.35
Blast Loss	34.15	....	34.47	....
"Silicates"	20.50	....	20.50	....
Potential Composition				
C_3S	....	67.9	....	76.0
C_2S	....	13.2	....	4.1
C_3A	....	6.0	....	6.2
C_4AF	....	8.6	....	9.0

TABLE 2: RAW MIXES WITH A CONSTANT LIME PERCENTAGE

	Raw Mix *C*		Raw Mix *D*	
	Unignited	Ignited	Unignited	Ignited
Oxide Composition				
SiO_2	14.65	22.32	15.20	23.30
Al_2O_3	2.57	3.92	2.61	4.00
Fe_2O_3	2.02	3.08	1.78	2.73
CaO	42.72	65.09	42.72	65.51
MgO	3.09	4.71	2.85	4.37
Blast Loss	34.37	....	34.79	....
"Silicates"	20.60	....	21.00	....
$CaCO_3$	76.23	....	76.23	....
Total Carbonates	83.90	....	83.30	....
Potential Composition				
C_3S	....	64.6	....	58.7
C_2S	....	15.3	....	22.6
C_3A	....	5.2	....	6.0
C_4AF	....	9.4	....	8.3

the proportioning, and oxide analyses are run on 24-hour composites. With uniform materials this method of control is quite successful, but with variable materials there is too much time lapse between the proportioning point and the samples taken of the mix.

When variable materials are used, it is advisable to machine sample the proportioned rock before it goes into the mill feed bins, and then test the samples for the lime or "silicate" content. By this method, much time is saved in making necessary corrections in the proportions of rock being drawn. Then in order to get a quicker check on the percentages of oxides in the proportioned rock, and to determine the holding point for the carbonate or "silicate" test, an analysis may be run at any time on composites of these rock samples. A complete analysis, with calculated potential compound compositions, may be run within three hours by clinkering a three quarter gram of the sample in a weighed platinum crucible over a blast torch, and then using the quick perchloric acid method. Changes in the percentages of limestone, shale, silica, and iron ore being drawn, can then be determined from these analyses.

Some dry plants have adapted a variation of the slurry blending tank system for a secondary proportioning of variable materials. The rock is proportioned in 250 to 300-ton batches. Each batch of rock is machine sampled while being transferred to storage bins where it remains until a "silicate" or carbonate test has been run, and the laboratory has issued orders to draw the rock and transfer it to the mill feed bins. If these tests show a higher or lower lime or "silicate" percentage than desired, a correction is made in the proportions of the next batch so as to balance the one already drawn. By this system it is possible to obtain any desired percentage of "silicates" or carbonates in the rock being transferred to the mill feed bins by averaging one or more batches and drawing them simultaneously to mix them on the conveyor belt. It is also possible to run analyses on composite samples of these batches, so as to check the oxide content of the proportioned rock.

Regardless of the system used in the preliminary proportioning of the rock and of the grinding to the required fineness, the finished raw mix is usually automatically sampled before going directly to the kilns or to the storage silos. The main control analysis of the raw mix is now run on composite samples of the feed to the silos, and the laboratory learns whether the mix is within the C_3S limits and also if the percentages of oxides are within the specification limits. Corrections in the proportions for the follow up mix can now be more accurately determined.

If the raw mix goes into storage silos, the last step in the laboratory's control of the mix is the drawing of the feed for the kilns. Through experience it has been found that a good blend may be obtained by filling the silos consecutively and drawing them all simultaneously. As it is necessary to know the differential between the feed to the kilns and the clinker burned from it, an analysis is run on each 24-hour composite of kiln feed samples and the resulting clinker samples.

As the raw mix passes through the kilns a considerable amount of material is carried off by the draft. When each particle of mix is composed of combined limestone and shale, as in a cement rock, the loss of material causes very little change in chemical analysis of the clinker from the kiln feed. But when the raw mix has been made from non-combined raw materials, each particle will be pure lime or shale, and as the lime is lighter in weight its loss will be considerably greater than the other. The result will be a decided decrease in the C_3S in the clinker. By the use of this differential of C_3S the laboratory is able to determine how high it will be necessary to keep the lime in the silo and kiln feeds in order to finish up with the desired C_3S in the clinker. Changes in the firing conditions of the kilns will vary this differential from time to time.

Thus by keeping a constant check on the flow of variable materials from the quarry to kilns with quick "silicate" or lime tests, and with frequent complete oxide analyses of the proportioned rock, ground raw mix, and feed to kilns, the laboratory will be able to keep the mix within the C_3S and oxide percentages limits, and obtain a more uniform cement clinker.

Labor Relations

(Continued from page 79)

ticularly significant because the roofing company had made a five-year contract with the manager who succeeded the G.I., and it was a regular custom with the company to transfer its branch managers from place to place.

Admitting that here was a difficult case, the court nevertheless rendered its decision according to the letter of the law and restored the ex-serviceman to the particular branch office job he insisted upon, with back salary to the time he applied for the job. One consideration was the fact that the petitioner had a home in this particular city, and the court recognized a scarcity of housing generally. The roofing company was also charged the court costs.

From various rulings by arbitrators on interpretations of seniority rights in union contracts, it is evident that the exact wording of these clauses is of supreme importance. For example one arbitrator, appointed by both parties to the controversy, ruled that the employer need not consult the union in the matter of selecting a "working leader," unless this was expressly provided for in the contract, provided also the management used its best judgment in good faith in selecting the man for promotion. In another case three arbitrators ruled two-to-one (employer representative dissenting) that the employer was bound by the letter of the contract clause which provided: "In making promotions the company shall consider qualifications of the man for the job, taking into account ability, efficiency and length of service." The employer was denied the promotion of a junior employee over a senior because in the opinion of the majority of the arbitrators the senior passed over was as capable as the younger man.

The arbitrators' award actually scored the younger man's evident enterprise as follows: "In addition, it appears that Davis (the company's choice) employs considerable showmanship in his relationships with his superiors. Prior to December 1, 1945, Davis had purchased a set of mechanic's hand tools, and had brought this fact to the attention of the Mechanic No. 1 with whom he worked."

Left: Centerline plant of Frank J. Knight Co. Right: Recently built Dearborn plant

Promote Special Qualities of Ready Mix

Dispersed-cement concrete expands volume of ready mix producer

THE CITY OF DETROIT, Michigan, and its surrounding communities, like many other metropolitan centers, is having a construction boom. Building of all types and considerable industrial construction is taxing the capacity of the ready-mixed concrete industry, but that is not the only factor that has increased business volume for specific companies. Merchandising is playing a significant part.

The Frank J. Knight Co., a large contractor and a producer of ready-mixed concrete for some 20 years, with offices in suburban Centerline, is outstanding in the sense that it now operates an enlarged fleet of transit mixers in line with an increased volume of business, but credits this increase in volume to the particular qualities of its concrete and an energetic program of merchandising these qualities.

A pronounced increase in concrete sales has resulted since the company's successful bid to furnish over 20,000 cu. yd. of transit-mixed concrete for a new Veterans' Hospital. The specifications were written to provide a concrete with more than ordinary resistance to the penetration of water and, with the assistance of the engineering staff of the Master Builders Co., manufacturer of Pozzolith, a cement dispersing agent, the Frank J. Knight Company was given approval for the use of Pozzolith concrete. That was in June, 1945, when a plant was built at Dearborn (Henry Ford's town) to serve that project. Since then, the plant has taken on permanent status and the main plant, at Centerline, has been adapted to batch that type of concrete as well.

Of particular interest is the fact that the sale of concrete in all channels has been increased well above the normal level expected with the present volume of construction through standardization—of a particular concrete—and sustained, aggressive merchandising by the Frank J. Knight Company with the cooperation of the Master Builders Co.

There is more than merchandising and advertising, in fact, to the program of the Master Builders Co., whose engineers devote much of their time to working closely with architects, engineers, contractors, and specifying agencies of the city, county, state and local federal government. The purpose of dispersion, accomplished by a lignin derivative in this case, is to deflocculate the cement particles increasing the surface area available for hydration; and the data, independent laboratory tests, etc., utilized in the engineering promotion of the product stress the properties of the resultant concrete.

Automatic dispenser for Pozzolith solution

In the Detroit area, concrete with the dispersing agent added is being specified by many large users and has become the standard product of the Frank J. Knight Co., in fact, is sold competitively with high early strength concrete, waterproof concrete, air-entrained concrete, and regular strength concrete. It is claimed that dispersion of the cement particles and the reduction of mixing water adds to these specific properties of the mix. Standard portland cement and the regulation concrete aggregates are used in the mixes, with the addition of a liquid solution of ½ gal. of Pozzolith per sack of cement.

Concrete is specified on a strength basis on some work, and on other jobs according to batch proportions. The engineering department of the Master Builders Co. has established designs for the Frank J. Knight Co. which permit the company to use dispersion in all mixes at no increase in cost of materials. When concrete is ordered on a minimum cement content basis, the customer gets just that. If he specifies the dispersing agent, in addition, he pays a premium price for that concrete but, according to strength tests, as utilized in merchandising, gets as high as 25 percent greater strength. When strength or batch proportion concrete is specified, the dispersing agent is added according to the Master Builders' designs and, at no extra cost to the user, the concrete delivered is, according to the Frank J. Knight Co., more

plastic and stronger than the plain mixes ordinarily furnished under such specifications. This has been the practice at the Dearborn location since June, 1945, and at the Centerline operation since September of the same year. Another claim made by the Frank J. Knight Co. and the Master Builders Co., and supported by tests made by many authorities including reports from the U. S. Bureau of Standards, is that the dispersed cement concrete is far more durable than plain mixes and that the air content of the mix meets the requirements of and is approved by federal agencies. This improved durability is cited by the Frank J. Knight Co. as an important factor in stimulating increased sales for concrete pavements.

Plants

Frank J. Knight Co., while old in the ready-mixed concrete business, built the present Centerline plant in 1941 and has just completed a year at Dearborn. Each plant will batch and deliver up to 500 cu. yd. of concrete per day. The truck fleet comprises 18 transit mixers (Smith and Jaeger) of 3-, 4-, and 5-cu. yd. capacities, some of recent high-dump design, with various types and makes of chassis and engines. Gradually, the fleet is being converted to Diesel engines, which is especially desirable at the Dearborn plant where maintenance services are necessarily more limited.

There is nothing novel in the basic layout of either plant, with the exception of facilities for quick and accurate automatic batching of the dispersing agent. Centerline is the more efficient plant, being originally designed for permanence. It is a C. S. Johnson batching plant. Supplementing the overhead bin capacity are auxiliary bins alongside which pay out aggregates to a belt bucket elevator serving the overhead bins. A crane loads the auxiliary bins from railroad flat bottom cars or from stockpiles. Both plants have large capacity in stockpiles, aggregates being shipped in by rail from the Oxford, Mich., sand and gravel plants north of Detroit, and both handle bulk cement.

The Dearborn layout necessitates two stops for the transit mixers. Cement is charged into the drums from a 350-bbl. Butler bulk cement plant after the drums have been charged with aggregates, water and dispersing agent from a C. S. Johnson aggregates batching plant of modest bin capacity. An auxiliary separate aggregates bin serves the purpose of batching special sizes of aggregates such as 1½-in. gravel as specified by Wayne County. The big volume is in concrete with 1-in. top size gravel. Winter heating is restricted to the mixing water.

Both plants are equipped with automatic Pozzolith dispensers, the agent flowing into the mixer drum with the mixing water. This device is simple to operate. Varying quantities for different loads are set by a mere turn of a pointer on a dial, graduated in bags and pounds of cement, so that the dial reading corresponds to the amount of cement used in the batch. The operator presses a button when the agent is added to the concrete.

Charging mixer at the Dearborn plant

Handling and dispensing equipment for the admixture, supplied by the manufacturer and illustrated herewith, has been described in recent issues of ROCK PRODUCTS. Briefly, it consists of mixing and storage tanks for the agent in solution, a small pump, and the automatic dispensing device with control dial.

When the operator presses the button a solenoid valve is opened, delivering the required amount of solution which flows into the mixer drum. A time delay switch is the means of closing the valve and automatically starting the pump to refill the dispenser with solution.

Frank J. Knight is president of the company and Nelson J. McBride is secretary-treasurer. Ted Knight, recently honorably discharged from the Navy, has assumed responsibility for plant operations.

Airport Drainage

MANUFACTURERS of concrete pipe and producers of aggregates and ready mixed concrete will be interested in a mathematical formula developed by Dr. Arthur Casagrande, associate professor of civil engineering at Harvard, and William L. Shannon, engineer in the U. S. Engineer's office in Boston to determine drainage capacities of saturated base courses of air fields. Dr. Casagrande came to the conclusion that the time required to effect a given amount of drainage of a saturated base course will increase with the square of the width between drain pipes; that is, in general with the square of the width of the pavement.

For example, if for a given base course material and thickness 24 hours would be required to effect 50 percent drainage of a 20-ft. wide road pavement, then a runway of a width of 200 ft. would require $10^2 =$ 100 times longer; that is, 100 days to effect the same degree of drainage. Obviously, it is important to design the base course so that the period during which the bearing capacity of the base will be substantially reduced, be shortened from 100 days to only a few days. Dr. Casagrande presented his formula at a recent meeting before the American Society of Civil Engineers.

Price Relief Ends Strike

LOUISVILLE, KY., sand and gravel and ready mixed concrete companies recently settled a month long strike with an agreement to pay a 10-cent an hour increase in wages. The agreement ending the sand and gravel truck drivers' strike followed by two days the approval by O.P.A. of a 50-cent a ton price increase to the companies. The sand and gravel price adjustment boosted the price from $1.30 to $1.80 a ton. Ready mixed concrete companies immediately asked for similar relief from O.P.A., indicating that the increased cost of aggregates would add about $1.00 a cu. yd. to the cost of producing ready mixed concrete. The ready mixed concrete companies involved are American Builders Supply Co., Colonial Supply Co., Concrete Supply Co., Consumers Supply Co., and St. Matthews Lumber & Supply Co. Sand and gravel companies receiving the price increase are Nugent and Co., Ohio River Sand Co., Louisville Sand and Gravel Co., and the E. T. Slider Co. The price increase applied to Louisville and Jefferson County, Ky., and Floyd County, Ind.

Batching Air-Entrained Concrete

Lake View Sand & Gravel Co. takes frequent moisture samples of aggregates before batching

Line-up of modern transit mixer trucks in front of batching plant

TO ATTAIN uniform accuracy in the water: cement ratio, Lake View Sand and Gravel Co., Fond du Lac, Wis., takes frequent moisture samples of aggregates before batching. A large part of the business is in concrete made with air-entrained cement, which, according to E. L. Clement, manager, compares favorably in 28-day strength with that made from standard portland, providing the proper small but definite reduction is made in the water: cement ratio. As this reduction is on the order of 6 percent for a mix which in standard portland will give 3000 p.s.i. in 28 days, it is apparent that close control is very desirable. Mr. Clement points out that this cement not only flows extremely well in the bins, but concrete made from it flows readily into restricted forms such as those used in making pipe, culvert, narrow piers and small footings.

The plant has a daily capacity of 500 cu. yd. Trucks from the sand and gravel washing plant a few miles distant, dump through a grizzly at road level, into a 10-cu. yd. hopper. A ramp is thus dispensed with.

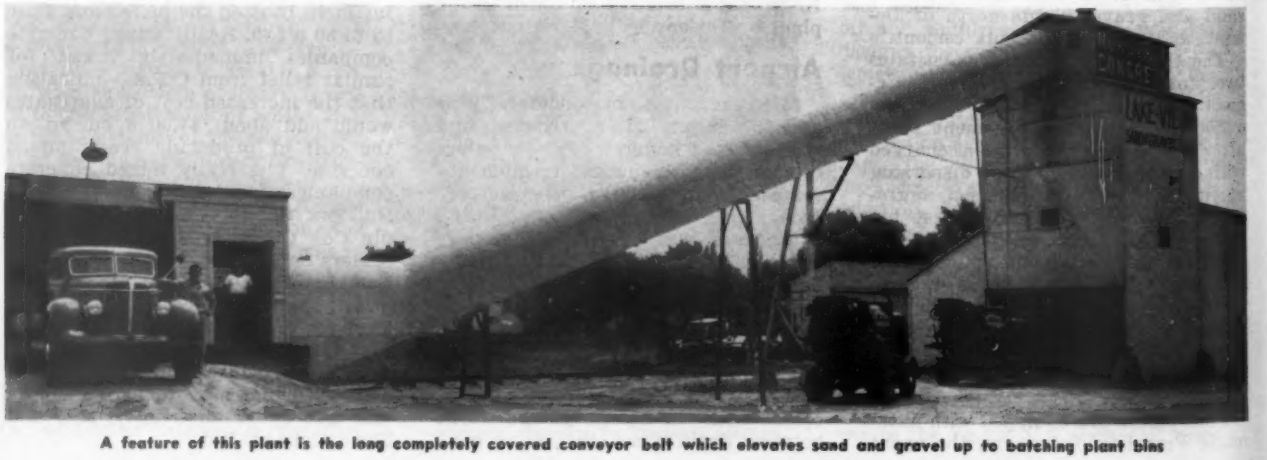
A 24-in. Atlas inclined belt conveyor elevates the aggregates to a four - compartment bin above the batching floor. A turn head spout, by the same manufacturer, determines to which compartment delivery will be made. The control is located at the truck unloading station and looks very much like a ship's helm. This wheel or helm operates the turn head through a cable and sheave arrangement, the positions of the spokes relative to a marked register board back of the helm, indicating the compartment to which discharge is made.

Two Screws Feed Cement Bins

Cement is discharged into feed hopper either by bulk truck or bulk railroad car, although cleated belt conveyor may be used to move bags from truck to batching floor. The hopper is emptied by a screw which feeds a 12-in. bucket elevator discharging to the cement bin above the batching floor. Again, in line with the policy of accuracy, this bin is equipped with two separate screws feeding the batch weighing hopper; one exclusively for air-entrained cement, the other for standard portland, high early, etc. Mr. Clement points out that a screw retains approximately 800 lb. of cement after bin is emptied, and therefore changing brands of cement using one screw would result in contamination. This is most important in the case of using cements requiring different water: cement ratios, such as air-entrained cement.

Batching equipment has been supplied by Butler Bin Co., in which cement weighing is fully automatic and electrically controlled. Aggregate weighing is by manual cut-off. Water is measured volumetrically with a float-and-cut-off valve arrangement. A McAlear temperature regulator in the line from the low pressure boiler to the measuring tank, helps to maintain the temperature of the mix water at about 70 deg. F., during the winter season. Live steam pipe connections to the sand and gravel bins warm the aggregate. The entire plant is housed, including truck receiving hopper and the conveyor belt to the bin.

Although a considerable portion of the business is in street and road



A feature of this plant is the long completely covered conveyor belt which elevates sand and gravel up to batching plant bins

paving concrete, a constantly expanding market is coming from farms. This market is being successfully served over a radius of 35 miles. A fleet of four 2- and 3-cu. yd. Rex mixers on International trucks also serve burial vault manufacturers and pipe manufacturers.

Mrs. Pierce Purcell is owner of the Lake View Sand and Gravel Co., and E. L. Clement is manager of both the sand and gravel and ready-mixed concrete plants.

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Artist's conception of the appearance of the Devil's Slide, Utah plant after completion of the improvements

Ideal to Build Two New Cement Plants

TO KEEP IN STEP with the growth in population, agriculture and industry in the Rocky Mountain area, the Ideal Cement Company has launched a big expansion program, briefly referred to in the August issue of ROCK PRODUCTS. During World War II, the company's plants in Colorado and Utah set up some outstanding records of production, but only at the expense of equipment which was already old and in many cases uneconomical.

With the close of the war in August, 1945, a contract was let immediately for the construction of a new packhouse and storage silos at the Devil's Slide, Utah plant, laid out in such a way that five different types of cement could be packed at one time without any danger of contamination.

As studies proceeded on the method of rebuilding the two old plants, the post war demand for cement grew to such proportions that it became immediately apparent that no time would be available for repairs to the old plants without the loss of much needed production. Further studies and an analysis of the market possibilities convinced the management that for a few years, at least, the demand for cement for the pent up post war building program would justify additional production in both the Colorado and Utah areas, and plans were finally developed to build two entirely new plants, one at Portland, Colo., and one at Devil's Slide, Utah. In each case the new plants will be erected alongside the old plants. The work will be carried on in such a way that production of the existing plants will not be interrupted even for a day.

When the new plants are complete, there is a likelihood that production of both the old and the new plants will be required. When this hoped for demand slackens, the old plants will be discontinued and the modern economical plants will presumably take care of the market requirements, leaving the old plants for standby production if necessary.

The new plants will be practically identical. Both of the old plants have been operated as dry process. Both of the new plants will be wet in order to make possible closer control.

Equipment and Layout

A contract has already been let at Portland, Colo., to the Stearns-Roger Manufacturing Co. covering the construction of a new crushing plant. The new crusher will be located in the quarry and will be a two-stage operation with a Pennsylvania roll crusher for primary and a Pennsylvania Impactor for secondary crushing. The material reduced to ¾ inch will be transported by a belt conveyor across the Arkansas River, railroad tracks, and main highway, some 2,000 ft. to the plant site. This conveyor system will replace electric motors which had drawn side dump cars from the quarry to the old crusher which was located at the plant site. Two new electric shovels in the quarry will replace three steam shovels, all more than 35 years old. Haulage from shovels to the crusher will be by Euclid quarry trucks.

Practically the same layout will be installed at the Devil's Slide quarry. Both plants will be open-circuit on the raw side, using 8 x 40 ft. compartment mills. Each plant will have two 9 ft. 6 in. by 375 ft. kilns with chains in the feed end. Finish grinding will be in 8- x 40-ft. compeb mills closed circuited with air separators.

The finished product at Devil's Slide will go to the new silos which, as the illustration shows, are practically completed at the present time. At Portland the old storage silos built in 1923 will be used, but an addition consisting of a warehouse floor of approximately 10,000 sq. ft. in area will be built to permit the packing of special types during off hours on to the floor. Cement stored on this floor will be loaded during peak hours to cars or trucks as required.

As announced in ROCK PRODUCTS, August, 1946, the Ideal Cement Co. acquired the sinter plant at Mobile, Ala. from the Reconstruction Finance Corporation, including kilns. While two of these will be left at Mobile for the production of cement, the other six will be shipped to Colorado and Utah, and three at each place will be remodeled into two of the 375 ft. length. Other machinery and equipment at Mobile also will be available for the new construction in Colorado and Utah. In spite of this acquisition, however, the Company officials estimate that each of the new plants will cost between $2,500,000 and $3,000,000, in addition to the cost of the Mobile surplus.

It is interesting to note that production of the new plants, estimated at 4,000 bbl. per day each, will approximately double the present production at the Portland plant and nearly treble the present production at Devil's Slide during the time that both the old and the new plants are in operation. It is quite likely that this production will be more than is necessary even during the next three or four years when construction is expected to reach a peak. However, Mr. Charles Boettcher and Mr. C. K. Boettcher, as well as other executives of the company, have a great faith in the continued growth of the Rocky Mountain Empire, and the decision to build these new plants is the result of that faith.

A CHEMICAL VIEW of Flotation Processes

Part 4: Essential requirements of the flotation circuit and the distributing system for chemicals involved

By JAMES A. BARR, JR.

EVEN MECHANICAL BODIES must have their systems of veins through which flow the many process giving chemicals—both organic and inorganic. The complexity of a distributing system is essentially dependent upon the number of functions which the chosen chemicals must perform.

In mineral preparation and flotation circuits, the more simple the process, the less complex is the system for the storage of chemicals, and the make-up section for subsequent preparation of each reagent.

A simple flotation circuit would require at least two or possibly three chemicals: a mineral acid or alkali for hydrogen ion concentration (pH) control, a cationic organic ammonia or an anionic organic acid for filming one or more of the minerals with a hydrophobic, water repellant, surface and probably a third chemical to act as a frothing agent.

Flotation reagents for non-metallic minerals are a varied group of chemicals differing widely in their physical characteristics. They range from water soluble liquids and solids to water insoluble liquids and solids at ordinary temperatures. In every flotation mill, whether it be in the feed preparation section, the flotation circuit, or in the section preparing the concentrates for market, each chemical must be introduced into its proper place under such conditions and in such form that it can perform its intended function.

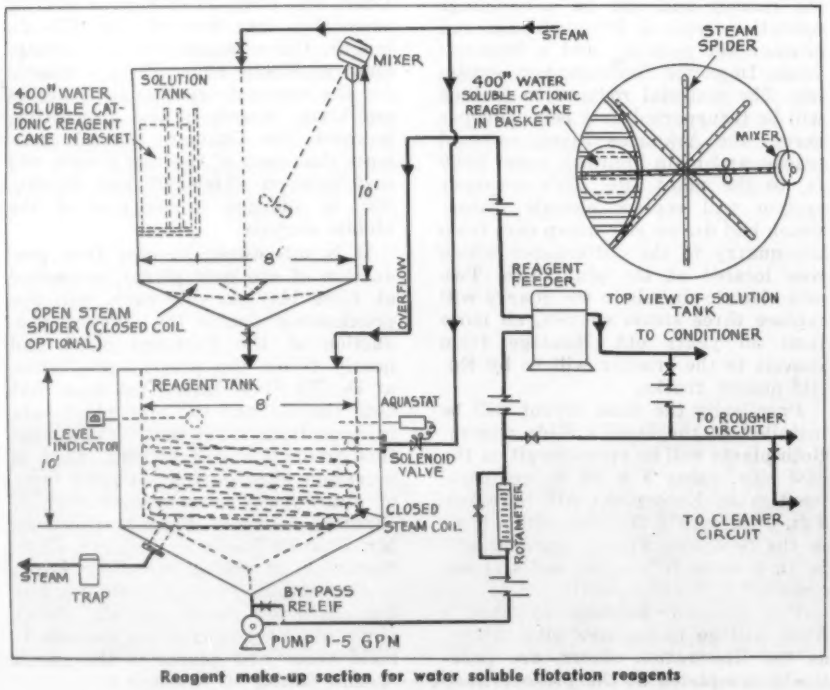
For the small operation it is adequate and convenient to receive all chemicals in quick lock 400 lb. open head drums. The chemical is contained in a durable package conveniently resealed after the desired amount of reagent has been removed. Larger operations which prepare often as much as 12,000 tons of flotation feed per day must receive and store reagents in such large quantities that it is economical to have a tank farm which includes a tank for each pumpable liquid used in large quantities. Chemicals in this group include the various fatty acids such as crude tall oil acids, refined tall oil acids, fish acids; hydrocarbons such as fuel oil, distillate and kerosene, and inorganic alkali and mineral acids such as liquid sodium silicate and sulfuric acid.

Careful selection of methods and mechanical equipment to handle corrosive and non-corrosive liquids under all possible local atmospheric temperature changes is very necessary to assure an operator of minimum chemical distribution costs, chemical maintenance costs and avoidable charges due to loss of operating time. I think every metallurgist working in a non-metallic flotation mill will agree that he is beset with so many disheartening variables in mineral flotation behavior, that it is absolutely necessary for his reagents to be under perfect control.

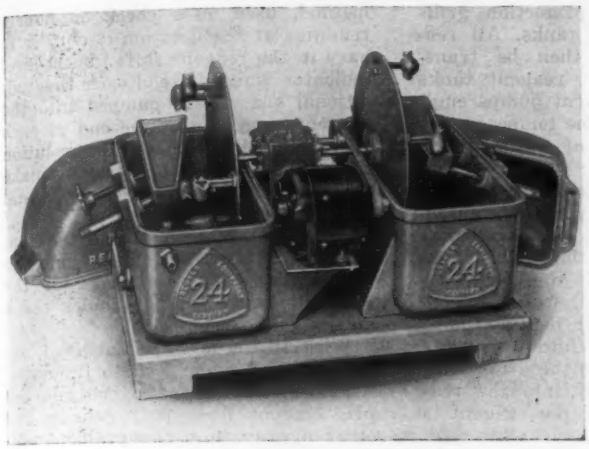
Water Soluble Chemicals

The water soluble flotation reagents and auxiliary chemicals are both solids and liquids at ordinary temperatures. Those flotation reagents commonly used as solutions to assure maximum dispersion within the flotation circuit and through the flotation pulp are the water soluble salts of the high molecular weight aliphatic amines, soluble quaternary ammonium sulfates, chlorides, bromides, etc., soluble sodium salt of sulfonated petroleum hydrocarbons (mahogany soaps), soluble sodium salt of the various fatty acids (sodium oleate, etc.) and the soluble sodium salt of aliphatic acids from petroleum origin. These reagents are shipped preferably in drums but at times are also shipped in tank cars.

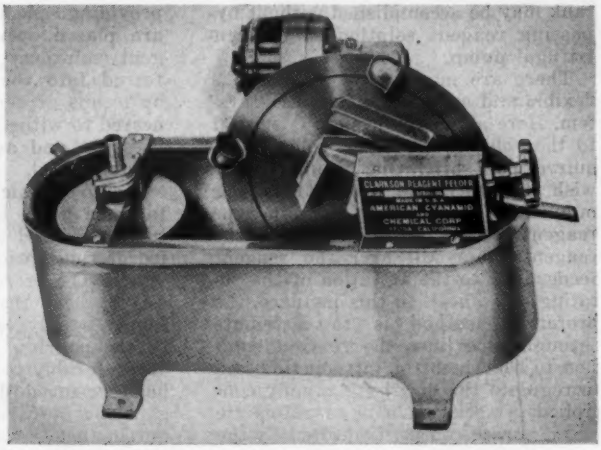
Soluble auxiliary chemicals used for the numerous operations such as desliming, dispersion, depression, pH control and thickening aids are more often inorganic solids. These include soda ash, caustic soda, disodium phosphate, trisodium phosphate, tetrasodium pyrophosphate, sodium hexametaphosphate (Calgon), sodium cyanide, lime, quebracho, solubilized proteins and starches. Caustic soda is sometimes received in flake form in drums but more often in the economical solid cake cast into and contained in a very light gauge non-returnable



Reagent make-up section for water soluble flotation reagents



Tandem arrangement for a cup type reagent feeder



A cup type reagent feeder with automatic level control

drum which is easily removed with an ax. All the other soluble auxiliary chemicals are received in moisture-proof multiple walled paper bags which are easily handled both in the storage room and in the chemical make-up section.

Water Insoluble Chemicals

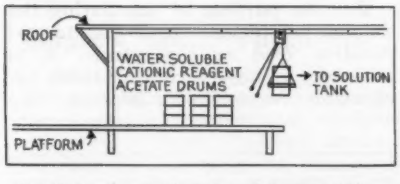
The water insoluble chemicals are all organic in nature and make up that group known as flotation collectors or promoters and collector aids. This group also consists of both solids and liquids at ordinary temperatures. Free unneutralized high molecular weight aliphatic amines, sulfonated petroleum hydrocarbons, sulfonated fatty acids, petroleum aliphatic acids, fatty acids, fuel oil, distillate, and kerosene all fall into this general group of water insoluble chemicals. Some of the chemicals are readily emulsified but their solubility is negligible.

More consideration must be given to the collector group since it is essential that the collector be always in a liquid state or transformed from the liquid state into an emulsified solid state if the maximum use of the reagent is to be attained. For without dispersion within the flotation conditioner or flotation circuit, reagent costs are always excessive and mineral selectivity is poor.

Heating Systems for Fatty Acids

Most of the refined fatty acids used in froth flotation processes for nonmetallic minerals are liquids during the warm summer months. Those crude products, which have relatively insoluble components such as the rosin acids in crude tall oil acids, are liquefied by steam heat and then mixed 50-50 with either crude fuel oil or a mixture of fuel oil and distillate, depending upon the temperature at which they are to be pumped. Often, however, a hydrocarbon is not wanted in the flotation process, so the crude fatty acid must be maintained in a pumpable liquid state by installing closed steam coils in the large storage tanks as well as in the smaller shift reagent tanks from which the fatty acid reagent is withdrawn to meet reagent requirements for daily operation.

The more highly refined fatty acids which usually are purified by various processes, but more often by fractional distillation are used whenever the highest degree of mineral selectivity must be maintained. The solidification temperature of these refined fatty acids ranges between 10 deg. C. and 25 deg. C. During the summer months there is very little need to use steam to maintain the reagent at an elevated temperature. However, some of the fatty acids disperse so much more readily at temperatures above 40 deg. C. that the temperature of the fatty acid reagent is often maintained at temperatures even up to 90 deg. C. For the large operations, steam is



Detailed reagent storage and transportation

used for maintaining an elevated reagent temperature. Whenever the reagent consumption per day is low, then it may be more convenient to maintain an elevated reagent temperature by installing a thermostatically controlled immersion type Calrod electrical heater in a small reagent storage tank. Elevated temperature at the individual reagent feeders is maintained with small electric strip heaters.

Solution of Collectors

Preparation of water soluble flotation collectors requires a somewhat elaborate system for dissolving the dry solids in water, maintaining the correct solution concentration and elevating the reagent solution temperature to prevent gel formation.

Whether the reagent be the high molecular weight aliphatic amine acetates, petroleum sodium sulfonates, or fatty or petroleum soaps, the method for handling the reagent is essentially the same. An open solution tank having sufficient volume to make up simultaneously enough reagent solution for a one-shift operation may be constructed of ordinary 5/16-in. steel plate. If the reagent is very corrosive, it may be economical to use a stainless clad steel. Many neutral salts such as amine acetates do not attack the steel tank chemically. These reagents are, however, such excellent wetting agents that the aqueous solutions remove all rust formed each time the liquid level drops and exposes a bright clean surface subject to oxidation. For this reason it is advisable to consider either heavier or oxidation resistant reagent tanks.

It is always desirable to distribute the reagent at as high a concentration as possible. Economy of distribution is, however, often overruled by the necessity for obtaining correct reagent control and maximum dispersion of the reagent. For these reasons a 5% aqueous solution seems to be the concentration most often used in plant practice.

Reagent Distribution

Distribution of each flotation reagent, whether it be a water insoluble liquid or a solution, must be transferred from each shift reagent tank to that section of the mill where it is to be introduced into the circuit. Transfer is most economically accomplished with centrifugal pumps which are throttled enough to provide a constant pressure head and to provide adequate by-pass volume to assure agitation within the shift reagent tank. If the reagent distribution system is so designed that there is an appreciable overflow volume returning from cup type reagent feeders, then agitation of the shift reagent

tank may be accomplished without bypassing reagent solution at the centrifugal pump.

There are many ways to design a flexible and adequate distribution system. Here again the system is subject to the volume of reagent solution required per shift. One would hardly wish to distribute 60 gallons per minute by means of small cup type reagent feeders, and especially if the reagent foams all over the reagent feeder, due to the agitation of the rotating cup wheel. In this instance, the preferred method is to distribute through pipe lines the reagent solution to each point of introduction and to regulate the flow by manually controlled petcocks. If a more automatic and accurate control is desired by the operator, then there are many automatic and recording metering devices available to those who consider the long term costs rather than the initial capital investment.

For those operations requiring relatively small volumes of non-frothing liquids, the cup type feeders are very desirable and adequate for distributing and metering the reagents to as many points as it is desired to introduce a liquid reagent. For most reagents used in non-metallic systems the usual castings and stainless steel feeders are used. There are, however, a few reagents such as hydrochloric, hydrofluoric and sulfuric acids which require special resistant metals. Lead or any one of the recommended new synthetic resin or special glass equipment now available for transferring corrosive liquids should be considered.

A Flowsheet for Water Soluble Collectors

Drums of soluble paste or solid are most satisfactorily transferred by means of an electric hoist if the reagent make-up section is removed and above the elevation of the storage room. It is more economical to have the chemical make-up section below the level of the storage room floor, providing adequate protection grills are placed over the tanks. All reagent solutions can then be transferred into the shift reagent tanks by means of centrifugal pumps engineered to withstand the temperatures, pressure and action of the solutions to be pumped.

Many organic reagents are subject to some harm if very high temperatures are used over a prolonged period of time, prior to their solution in water. Therefore, it is the best practice to heat the solid, water soluble reagents only to their melting point before pouring them into the water or preferably to lower the drum with head removed directly into the reagent make-up tank if the reagent is not in flake form.

The tank is filled with the correct volume of water, heated either with an open steam spider or with closed steam coils if preferred. Solution of the high molecular weight soluble collectors is greatly speeded up by heating the water and by the installation of a high speed mixer at a point opposite the basket which prevents large chunks of solids from damaging the mixer and heating system.

After the solution is complete, the reagent is transferred to a shift reagent tank capable of containing at least one shift's reagent requirements. For some soaps it is not necessary for the reagent to be heated after this point on. However, if a 5 percent aqueous solution of the high molecular weight aliphatic cationic reagents is to be maintained, then the shift reagent tank is equipped with closed copper or steel pipe for heat transfer purposes. Constant predetermined temperatures are maintained with an immersion or surface aquastat governing a solenoid steam valve.

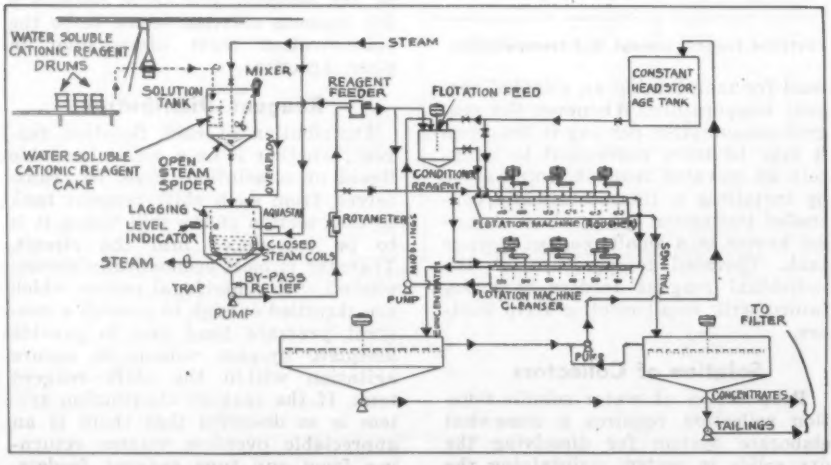
For the purpose of calculating the amount of reagent used per ton of flotation feed or concentrate, it is necessary to have several methods for checking reagent consumption. One method, used as a check on hourly readings at the flotation circuit, is to have in the reagent shift tank a level indicator which is read each time additional reagent is pumped into the reagent tank and at the end of each operating shift. Since the solution strength is known it is easy to make all calculations required for shift and daily records.

After the reagent leaves the reagent shift tank, the total volume can be regulated by rotameters, or the rotameter may act as a quick check on reagent consumption.

With all the new tools at hand, operators no longer need to dream of some of the automatic controls for pH, reagent flow, pulp density and other aggravating, changeable conditions.

I would not even intimate that a froth flotation mill for non-metallic minerals can be mechanically controlled, but whenever some of the controllable variables are removed from the operator's list of worries, he is much more able to exert his skill in the art at the place and at the time it is most urgently needed.

I know of no other way to utilize more effectively the energy of the limited number of men available who are truly skilled in the art of operating a non-metallic flotation mill.



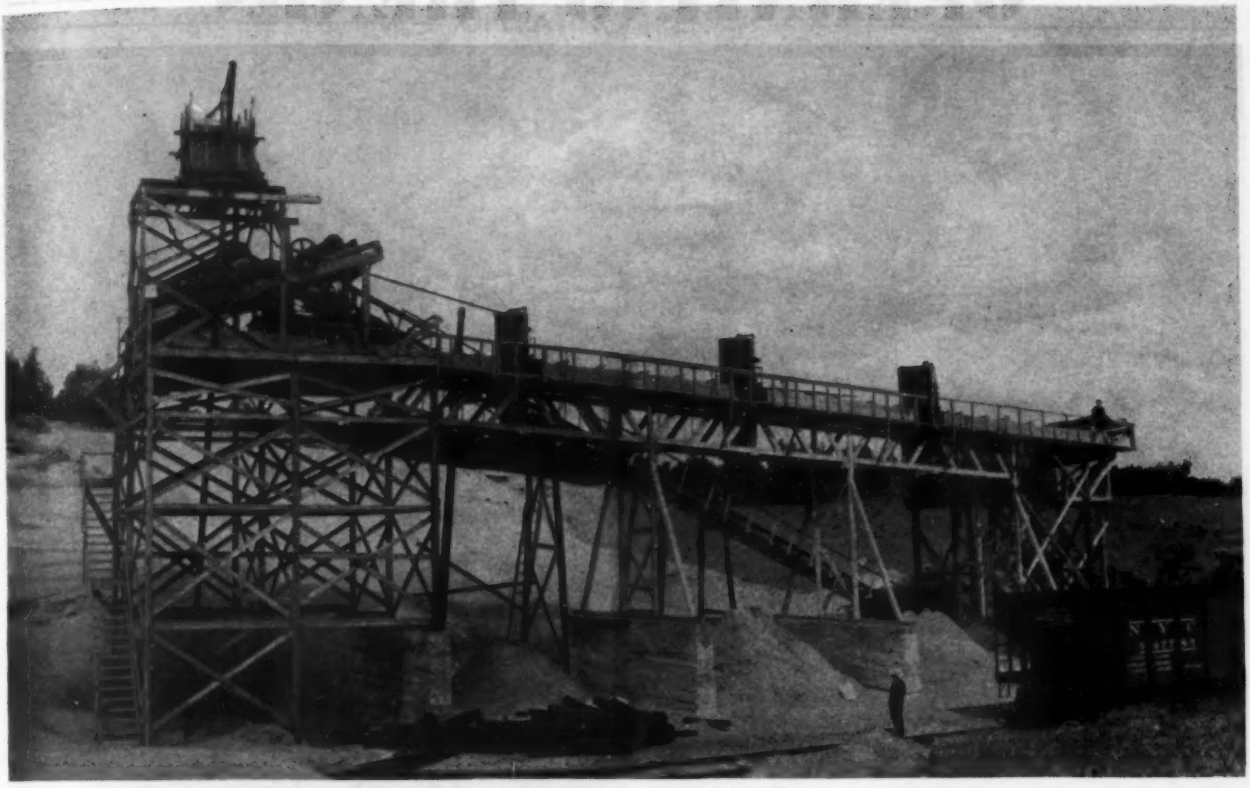
Flowsheet showing use of water soluble reagents in a flotation mill

Up Slag Output

OUTPUT of commercial blast-furnace slag in 1945 totaled 12,635,868 tons, a gain of two percent over 1944. Sales of air-cooled slag increased three percent. These statistics are based on a canvass conducted by the National Slag Association, of the 32 companies that prepared blast-furnace slag for commercial use, and assembled by the Bureau of Mines. Average prices ranged from 68c a ton for ballast to $1.34 for roofing slag. Of the total, 132,325 tons of air-cooled and screened slag were used as a concrete products aggregate. Railroad ballast took 3,396,483 tons, roads (other than concrete) absorbed 5,464,432 tons, and concrete pavements and structures used 944,976 tons. Cement manufacture involved 322,704 tons of granulated slag. Other large uses of slag were for airport runways, mineral wool, roofing slag, sewage trickle filter, and agriculture slag.

Marquette Wins Award

MARQUETTE CEMENT MANUFACTURING COMPANY'S annual report to its stockholders has been awarded first place among the Cement industry reports. Weston Smith, vice-president of the magazine "Financial World" and director of the magazine's annual survey of stockholders' reports, in announcing the award, said that an "Oscar of Industry" signifying the selection would be awarded at a banquet in New York on October 4.



Washing and classifying plant for the production of four grades of foundry sand

New Washing and Screening Facilities for Foundry Sand

To keep in step with the ever-increasing control requirements for foundry sand, the George W. Bryant Core Sand Co., McConnellsville, N. Y., constructed a new washing and screening plant.

The plant, which is 125 ft. long, is built on concrete piers with flumes, classifiers, sand drag and other equipment supported on timber bents and timber framing superstructures, as shown in the illustrations.

A slackline cableway system conveys sand from the pit to a hopper from which it is fed to a belt conveyor, 110-ft. centers, inclining up to the top of the plant. Sand is washed down a chute at the head of the conveyor into a conical revolving screen. The washed and screened sands move down a 4-ft. wide flume, passing through three classifiers and a drag box. Tailings are run off into a settling pit. Classifiers have been set to produce grades 64, 70/75, 80/85 and 115/120.

The conical screen, Shaw classifiers, and drag-box equipment were furnished by Link-Belt, horizontal induction motors are General Electric manufacture, and a Gould centrifugal pump supplies water from a nearby creek.

Catherine Bryant Hartman, assisted by her brother, has been actively in charge of this enterprising industrial sand company since the death of her father.

Enlarge Silica Facilities

The Mineral Products Co., Chewelah, Wash., plans to expand plant facilities to an investment of $150,000, according to Superintendent Leonard Ainsworth. According to Mr. Ainsworth, the silica sand found in the company's deposits, located two miles west of the Northwest Magnesite Co. quarries, is the finest quality in the State, ranging up to 98½ percent pure. Little crushing is required to make the 12 different grades which are processed. The company owns 16 quarries in the valley.

Oklahoma Glass Sands

"Geology and Glass Sand Resources of the Central Arbuckle Mountains," by W. E. Ham, assistant geologist of the Oklahoma Geological Survey, has been published as Bulletin No. 65.

The bulletin deals with the geology, structure, chemical composition, mechanical analyses, character of impurities, mining operations, distribution of deposits, and a summary of the glass industry in Oklahoma. Included in this bulletin are four detailed geologic maps, tables, and illustrations of operating plants. It can be purchased for 80 cents, including mailing charges.

Open Foundry Sand Plant

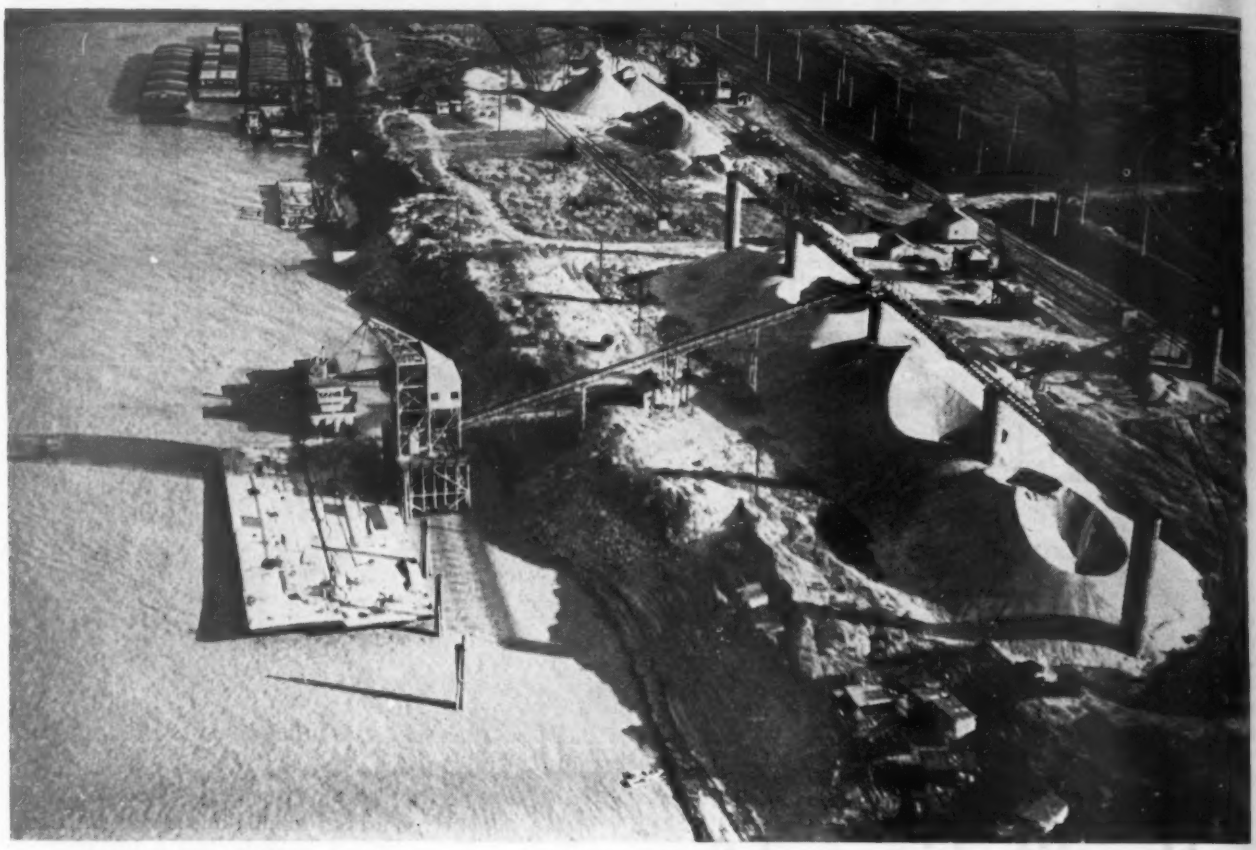
Concrete Materials Co., Waterloo, Iowa, has opened up a silica sand pit in the Clayton Hills near McGregor, Iowa. Title to 50-acre tract recently was acquired from the Langworthy Silica Co., Dubuque, Iowa. Plant expenditures of $50,000 will be made, according to a local announcement, and the principal outlet will be for foundry sand. The deposit in the past has been worked for glass sand.

Sell Silica Brick Plant

The War Assets Administration recently put up for sale the Gladding-McBean plant in Lehi, Utah. As an adjunct to the Geneva steel plant, the silica brick plant had a capacity of 4,000,000 brick a year during the war.

Open Branch Plant

Fontana Gravel Co., branch of the Triangle Rock and Gravel Co., is opening a plant at Fontana, Calif. The Fontana Gravel Co. is owned by R. J. LaVergne and Neal O. Baker.



Sand unloaded by gantry crane is conveyed to shuttle conveyor for stockpiling at St. Louis Materials & Supply Co. plant. Reclaiming tunnel under stockpiles feeds conveyor to carloading station

Missouri, an "In Between State"

Both old and new rock products' deposits are found in the State

By H. E. SWANSON and NATHAN C. ROCKWOOD

IN GENERAL the geological structure of Missouri is simple. Basement rocks of granites and felsite porphyries are cut by basic igneous dikes and are overlain by Paleozoic sediments ranging from Upper Cambrian to Pennsylvanian. Rocks of Permian, Triassic, and Jurassic (the later) ages are not known. Cretaceous and Cenozoic sediments are present in the Gulf Coastal Embayment region of southeastern Missouri. Glacial deposits cover most of that portion of Missouri north of the Missouri River.

A pre-Cambrian land mass that has been uplifted and eroded forms the central structure of the Ozark uplift. Succeeding Paleozoic seas encroached upon this land mass and in most instances overlapped it. Successive uplifts, accompanied by warping, locally by faulting, and followed by periods of erosion, have produced numerous successive breaks in the stratigraphic succession of sedimentation.

In some instances, as during the Silurian period, it appears that the seas advanced into the present Mississippi Valley region but did not overlap the Ozarks. The Devonian seas surrounded the Ozarks and at least in part overlapped the Ozark land mass, as shown by Devonian sediments at Rolla. Scattered outcrops of Mississippian rocks throughout the Ozarks suggest this land mass was inundated during that geological period.

Major erosional unconformities are present in the geologic column; however, portions of the rock sequence deposited were protected from erosion in depressed areas produced by faulting, folding, and solution caverns. Minor igneous intrusions in post-Mississippian time are known, but they are restricted to a relatively small area in Ste. Genevieve, Madison, and St. Francois counties. Intense faulting in post-Mississippian and possibly post-Pennsylvanian times has displaced the sedimentary rock formations as much as 1500 ft. vertically along the Cap-au-Gres fault north of St. Louis and in the fault block of Ste. Genevieve County.

Old Mountain Rocks

The St. Francois Mountains are located in Iron, Madison, Reynolds, St. Francois, and Wayne counties. Here granites, felsite porphyries, and basic dikes are at the surface. The Paleozoic sediments represented by dolomites, limestones, sandstones, and shales form roughly concentric belts around this igneous area, with the younger rock formations farther removed from the central mass. The regional dip is steeper to the east of the St. Francois Mountains than to the west; therefore the belt of outcrop of a formation to the west is considerably wider than the corre-

Left: At Missouri-Illinois Materials Co., St. Louis, sand is unloaded from barges by gantry crane. Right: Belt conveyors under stockpiles convey sand to enclosed bucket elevator, center, which discharges to main conveyor for transfer to storage bins

sponding belt to the east. For example, the Mississippian limestones in southwestern Missouri crop out in a belt ranging from 25 to 90 miles in width, whereas the Mississippian limestones in eastern Missouri occupy a restricted belt less than 7 miles wide; although the Mississippian limestones in Ste. Genevieve County are 400 ft. thicker than they are in Greene or Jasper counties.

Immediately overlying the igneous rocks is the Lamotte sandstone which forms a belt of outcrop around the igneous masses where they have been exposed through erosion. This sandstone is overlain and its outcrop is surrounded by a group of dolomite formations which contain shaly, sandy, and cherty zones. Within this dolomite zone there occurs the Roubidoux sandstone of considerable extent and the St. Peter sandstone which forms a long narrow belt across the southern half of the eastern portion of the State. In the eastern part of the State the Plattin and Kimmswick limestones are at the outer edge of the dolomite zone.

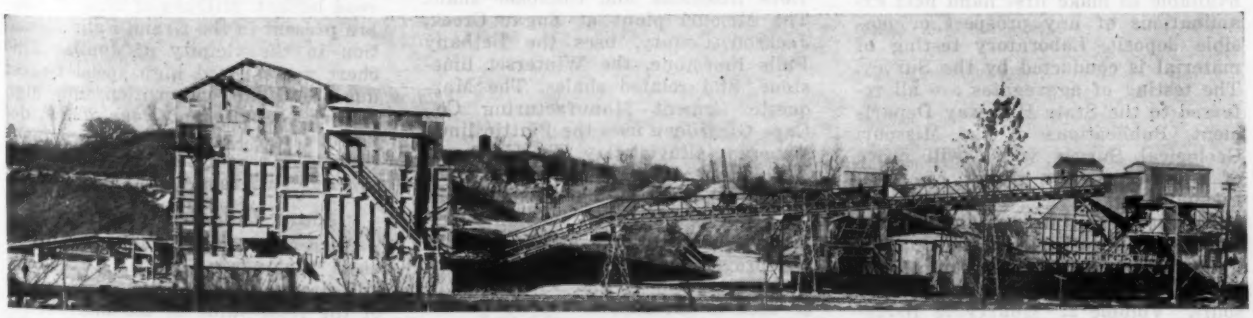
These three zones, granite, sandstone, and dolomite, roughly delineate the Ozark region and include lower Paleozoic rocks (Cambrian to Silurian, inclusively). Concentrically zoned around the dolomite area are the Devonian and Mississippian limestones, in which certain beds become quite shaly and cherty. In this zone are the Little Saline and Grand Tower marbles, and the Callaway, Cooper, Glen Park, Burlington, Keokuk, Warsaw, Spergen, St. Louis, and Ste. Genevieve limestone formations, each of which is being commercially operated at the present time. Surrounding this limestone zone are the Pennsylvanian shales, sandstones, and relatively thin limestones. The limestones of the Henrietta group and the Bethany Falls and Winterset limestones of the Kansas City group form irregular escarpments within the wide belt of outcrop of the Pennsylvanian shales and sandstones.

Gulf Coast Embayment

South of Cape Girardeau and east and south of Poplar Bluff, the meandering Mississippi and Ohio Rivers have eroded against the Ozark uplift to produce wide alluvial lowlands designated as the Gulf Costal Embayment. At places such as Delta, Cape Girardeau County, and Oran, Scott County, isolated hills of dolomite project above the lowlands, and rock quarries have been developed in these erosional remnants. Prior to the cutting of this alluvial lowland, the Cretaceous seas invaded this portion of the Mississippi Valley and it became a basin for the accumulation of deltaic sediments of sands and clays. These sediments were not firmly consolidated and were readily eroded. Large amounts of sediments washed down the major streams formed sand and gravel deposits which have been preserved as terraces. Such a terrace is Crowleys Ridge. Pits have been developed in these sands and gravels in the vicinity of Dexter, Bloomfield, and Malden.

Topography

The land surface of Missouri is controlled by several related features. Rock hardness and resistance to erosion and weathering produces elevations that stand out in sharp relief. The individual granite and rhyolite mountains in the St. Francois Mountains region develop bold relief and rise high above the surrounding sedimentary rock-covered valleys and lowlands. Such is Taum Sauk Mountain, highest elevation in the State, 1772 ft. above sea level. Where rivers have cut through the granite masses, picturesque "shut-ins" or narrow restrictions in the valleys have resulted. In regions such as the Pennsylvanian shale areas of the western portion of the State, the valleys are abnormally wide. A dam 1200 ft. long constructed on the Mississippian limestone at Osceola, St. Clair County, would produce a lake 12 miles wide where the river traverses the Pennsylvanian shales and calcareous sandstones. Adjacent



Pixley crushed stone plant operated by Stewart Sand & Material Co., Kansas City, Mo. Screen house is to the left, and to the right may be seen conveyor to loading out tower. Bituminous plant in center background

to the major streams, high relief has been locally developed. Rock fracturing and faulting has controlled the location and direction of flow of some streams.

The development of underground solution caverns and channels in the Ozarks has influenced the development of the drainage pattern. In north Missouri the glacial plain sloped to the south; and at the time of the melting of the glaciers, the major streams developed a drainage pattern of roughly southward-flowing rivers with relatively narrow interstream divides.

Glacial Results

Prior to the advance of the glaciers the Ozarks were reduced to a peneplain. Subsequent uplift and erosion resulted in the entrenchment of the major streams and their tributaries. During this entrenchment the stream channels migrated by erosion on the outside of the meander curves with resultant deposition on the inside of the loops or bends. This process of migration with erosion and deposition has produced long gradual slopes into the valleys on the inside of the curves and a steep, precipitous cliff on the outside of the curves. Sheer rock faces across the valley from alluvial floodplains, sand and gravel bars, and stream terraces are common on all such streams.

At the time of the advance of the glaciers into north Missouri the ice masses were depositing more than they were eroding. Stream valleys were choked, completely filled, and buried with glacial drift and possible outwash gravels and sands. Major streams, such as the Missouri River, were forced to seek new channels. These glacial channels have been mapped by drill holes and borings and are known to contain sporadic occurrences of sand and gravel. Extensive outwash plains and related fluvioglacial plains such as exist in many of the glaciated states are uncommon in Missouri. Consequently the glacial gravels are not extensively utilized.

Assistance from Survey

The Missouri Geological Survey has given great assistance to the producers of mineral resources. Geologists with this department are always available to make first hand field examinations of any prospect or possible deposit. Laboratory testing of material is conducted by the Survey. The testing of aggregates are all referred to the State Highway Department. Publications of the Missouri Geological Survey which will prove of interest to the reader of ROCK PRODUCTS include: Geological map, mineral resources map, drainage map, Volume 10, first series, "The Surface Features of Missouri," Volume 11, first series, "Clay Deposits of Missouri," Volume 2, "Quarrying Industry of Missouri," Volume 5, "Public Roads," Volume 6, "Lime and Cement Resources," Volume 15, "Sand and Gravel Resources," Volume 18, "Geology of the Mississippi Valley Area," Volume 28, "Fire Clay Deposits of East Central Missouri," and Volume 31, "Bibliography of the Geology of Missouri."

The Missouri Geological Survey carries on extensive coöperation with various State and Federal agencies, thus giving the benefit of wide contacts and diversity of knowledge.

Limestone and Hard Rocks

AS THE PRECEDING article on the geology of Missouri makes evident, the state is amply supplied with rock formations of all kinds. It is particularly fortunate in having an abundance of limestones. Within the Ozark region limestones are not common. However, the Mississippian limestones parallel the edge of the Ozarks in many places which makes this material readily accessible to those areas where limestones are not present. In eastern and southwestern Missouri the Mississippian formations, including the Burlington, Keokuk, Warsaw, Spergen, St. Louis, and the Ste. Genevieve are extensively quarried. At Ste. Genevieve a very high grade calcium carbonate oölite member of the Ste. Genevieve formation is extensively mined for lime, chemical uses, paints, and putties. In St. Louis the Ste. Genevieve, St. Louis, and Spergen formations have been developed in extensive quarries for concrete aggregates and cement. At Hannibal, Springfield, Galloway, Pierce City and Neosho, lime is produced from the Burlington and Keokuk formations. Marble is cut and polished from these formations at Carthage, Phenix, and near Foristel. The Mississippian limestones in general have proven to be most satisfactory for concrete highway aggregates. Other limestones that are extensively used include the Plattin and Kimmswick (Ordovician), Grand Tower, Little Saline, and Mineola (Devonian), and Ardmore, and Bethany Falls (Pennsylvanian). The Noix oölite (Silurian) at Louisiana has been used in putty making.

In the production of cement the Alpha Portland Cement Co., Alpha, St. Louis County, uses a mix of St. Louis and Ste. Genevieve limestones and Cherokee shale. The Missouri Portland Cement Co. at Prospect Hill, St. Louis County, uses the Ste. Genevieve limestone and Cherokee shale. The Misouri plant at Sugar Creek, Jackson County, uses the Bethany Falls limestone, the Winterset limestone, and related shales. The Marquette Cement Manufacturing Co., Cape Girardeau uses the Plattin limestone and alluvial clay. The Universal Atlas Cement Co., Ilasco, Ralls County, uses the Burlington limestone and Grassy Creek shale (Devonian). The Kimmswick limestone at this locality has proven satisfactory in the manufacture of cement and will probably be used in the future.

Table I presents the principal limestone formations in Missouri, their chemical character, and their principal uses.

Dolomites

The bed rock in approximately one-third of Missouri is dolomite. However, in the major portion of this area the dolomites are argillaceous, sandy, and flinty and very cherty. Very pure dolomites are found in Madison, Washington, Morgan, and Camden counties. These dolomites are satisfactory for the manufacture of magnesium. Metallurgical dolomite clinker is produced from the Bonneterre formation in Madison County. The Sedalia dolomite is used in the manufacture of rock wool, and this formation (Mississippian age) in central Missouri contains billions of tons of natural fluxing dolomitic limestone satisfactory for high quality rock wool. The Bowling Green dolomite in northeastern Missouri is also satisfactory for rock wool. The principal dolomite formations in Missouri, their chemical character, and their chief uses are tabulated in Table II.

The Agricultural Adjustment Administration has estimated that the soils of Missouri need more than 5,000,000 tons of agricultural limestone each year to preserve fertility, without any attempt to rebuild the soils to native lime content. Widespread limestone and dolomite deposits suitable for agricultural limestone are accessible in approximately 70 percent of the counties of the State. Great expansion of production may be expected in this field.

Hard Rocks

Hundreds of square miles of granite and porphyry outcrops suitable for monumental and decorative stone purposes have not been exploited. Portions are sufficiently low in iron to permit milling for feldspar recovery, and many are suitable for highway aggregates and high speed railroad ballast. Millions of tons of chert are present in the Grand Falls formation in the vicinity of Joplin. This chert makes good high speed ballast due to its low absorption and high French coefficient of wear. Thick deposits of loess suitable for the manufacture of ceramic ballast are located in strategic areas.

Many Industrial Minerals

A great diversity of industrial minerals is produced in Missouri. Clay and clay products comprise one-fourth of the total value of the mineral resources produced. Refractory products, tile, sewer pipe, and common

bricks are produced in many localities.

Silica sand plants are utilizing the St. Peter sandstone at Hermann, Pacific, Crystal City, and Festus. Deposits containing less than 0.02 iron are now being used for foundry sand as well as for the glass trade.

Rock wool raw materials are abundant. The Sedalia and Bowling Green dolomites are natural flux rock which produce superior wool. At Kansas City the Winterset limestone and shale have been blended to produce rock wool. The Bonneterre dolomite and Lamotte sand can be blended. Cherty beds of the lower Mississippian limestone in southwestern Missouri can be used for rock wool. At the present time a rock wool plant is being constructed at Easley in Boone County. The raw material will be the Sedalia dolomite.

Extensive barite mining is concentrated in Washington County. Sixteen washing plants are removing the barite from the red residual clay which has been produced by the decomposi-

Table I

Geological Horizon	Age	SiO_2	Al_2O_3 and Fe_2O_3	$CaCO_3$	$MgCO_3$	H_2O	Location
Iola	Pennsylvanian	2.08	0.86*	94.71	2.71		Jackson County
Raytown	Pennsylvanian	5.88	Al_2O_3 1.02 Fe_2O_3 1.97	84.49	3.77		Jackson County
Cement City	Pennsylvanian	5.48	Al_2O_3 0.98 Fe_2O_3 1.34	91.76	2.59		Jackson County
Winterset	Pennsylvanian	6.78	Al_2O_3 0.42 Fe_2O_3 1.06	87.58	2.18		Jackson County
Bethany Falls	Pennsylvanian	2.93	0.54*	96.82	0.46		Caldwell County
Bethany Falls	Pennsylvanian	8.81	1.02*	84.00	6.93		Daviess County
Bethany Falls	Pennsylvanian	2.83	0.48*	96.17	1.00		Jackson County
Hertha	Pennsylvanian	4.72	Al_2O_3 0.77 Fe_2O_3 2.47	82.37	8.63		Jackson County
Golconda	Mississippian	4.78	1.6*	96.35	2.03		Perry County
Ste. Genevieve	Mississippian	0.35	0.32*	95.92	1.56		Ste. Genevieve County
St. Louis	Mississippian	2.36	0.27*	96.09	0.90		St. Louis County
Spergen	Mississippian	0.22	0.25*	98.80	0.53	0.05	Ste. Genevieve County
Warsaw	Mississippian	0.69	0.21*	98.57	0.65		Jasper County
Keokuk	Mississippian	0.25	0.16*	99.28	0.16		Lawrence County
Burlington	Mississippian	0.35	0.97*	97.60	0.75	0.05	Boone County
Burlington	Mississippian	0.36	0.13*	99.34	0.22		Greene County
Louisiana	Mississippian	2.20	0.45*	95.70	2.00		Pike County
Cooper	Devonian	6.22	0.93*	89.66	1.55	1.63	Cooper County
Bailey	Devonian	23.29	Al_2O_3 1.20 Fe_2O_3 2.15	41 55	29.45		Ste. Genevieve County
Kimmswick	Ordovician	0.10	0.14*	99.52	0.50	0.27	Cape Girardeau County
Plattin	Ordovician	2.93	0.45*	87.23	9.26		Cape Girardeau County

*Combined Al_2O_3 and Fe_2O_3.

Table II

Geological Horizon	Age	SiO_2	Al_2O_3 and Fe_2O_3	$CaCO_3$	$MgCO_3$	H_2O	Location
Sedalia	Mississippian	23.36	1.66*	51.41	19.39		Boone County, 36–46–13
Sedalia	Mississippian	20.00	Al_2O_3 3.45 Fe_2O_3 1.60	CaO 29.02	MgO 10.68	2.50	Sweeney, Cooper County
Bowling Green	Silurian	Insoluble 11.50	3.42*	50.85	34.21		Pike County, 13–53–3W
Everton	Ordovician	8.26	Al_2O_3 0.36 Fe_2O_3 0.12	49.90	39.70	0.70	Lone Rock, Scott County
Jefferson City (Heavily pitted beds)	Ordovician	6.08	0.60*	52.16	40.39		Warsaw, Benton County
Jefferson City (Cotton rock)	Ordovician	13.27	0.52*	47.01	38.86		Warsaw, Benton County
Gasconade	Ordovician	1.00	Al_2O_3 0.91 Fe_2O_3 1.00	57.18	43.13		Washington County, 21–37–1E
Gasconade	Ordovician	4.78	Al_2O_3 1.66 Fe_2O_3 0.30	50.29	43.42		Shannon County, 16–30–4W
Eminence	Cambrian	0.16	Al_2O_3 0.36 Fe_2O_3 0.53	54.77	43.77		Camden County, 27–38–17
Eminence	Cambrian	0.28	Al_2O_3 0.48 Fe_2O_3 0.24	53.07	46.30		Washington County, 35–38–1E
Potosi (150' below top)	Cambrian	1.35	Al_2O_3 0.24 Fe_2O_3 0.24	52.29	45.46		Washington County, 13–38–1E
Bonneterre	Cambrian	Insoluble 0.32	Al_2O_3 0.79 Fe_2O_3 0.05	55.25	43.17		¾ miles SW of Fredericktown, Madison County. —

*Combined Al_2O_3 and Fe_2O_3.

tion of the Eminence and Potosi dolomites. Two grinding plants and an extensive preparation plant for the production of black ash and baroid are located in this field. In central Missouri barite occurs in local deposits known as circles. These deposits are relatively small, but the barite they contain is of superior quality and in great demand by the chemical and glass industries. Concentrates containing more than 98 percent $BaSO_4$ are produced in this central field.

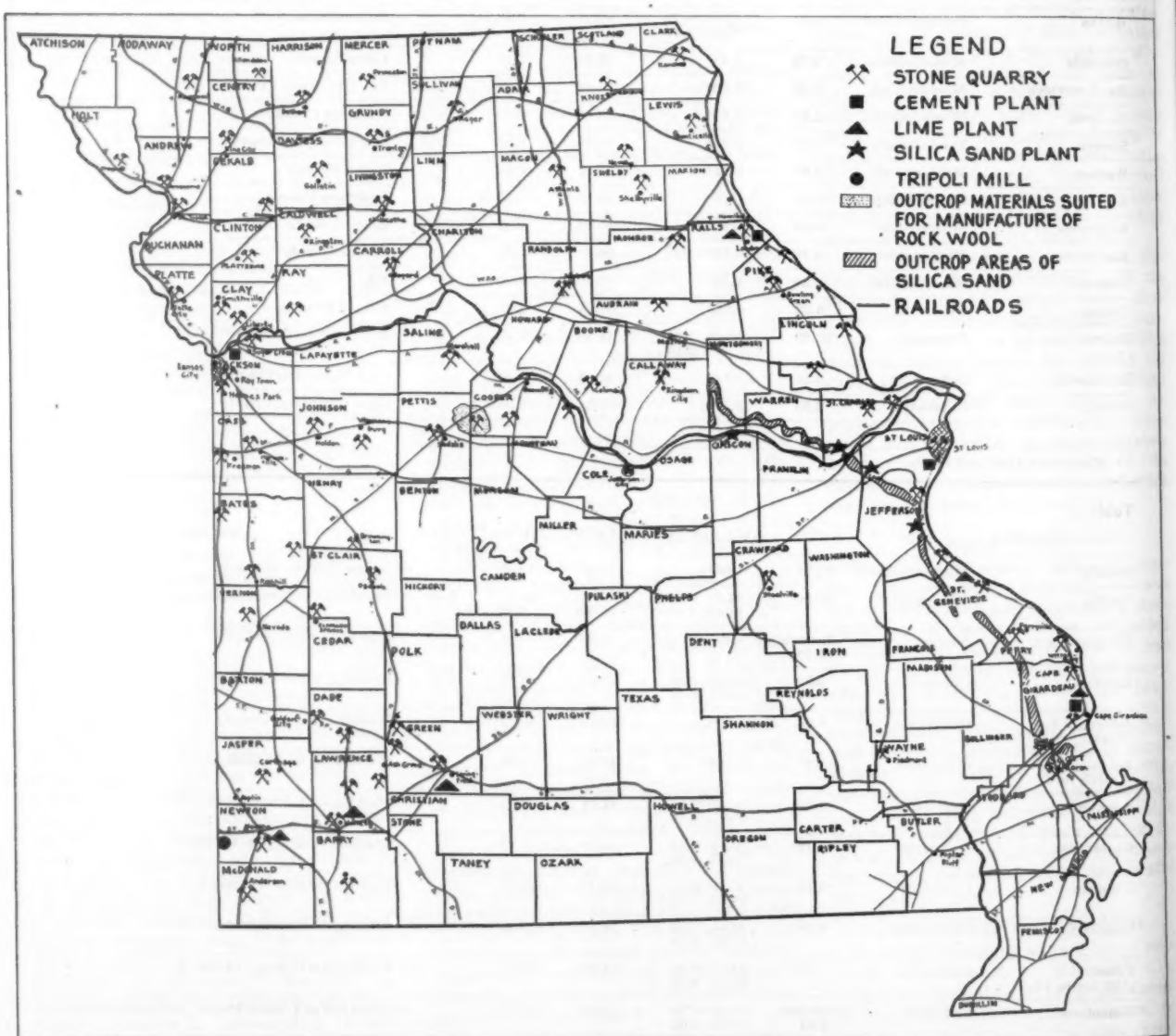
Special Building Stones

Many local sandstones, siltstones, and limestones, are used for building materials. Throughout the Ozark region the ripple-marked Roubidoux sandstone is used extensively for rock veneers. The quartz druse from the Potosi formation is artistically worked into many structures. The Northview (Mississippian) siltstone in southwestern Missouri is extensively quarried for fire-place and rock veneer purposes. In the St. Francois Mountains granite and rhyolite boulders are utilized. Throughout the Ozarks residual chert boulders known as field stones are employed in the construction of rather large houses and store buildings. The Warrensburg sandstone (Pennsylvanian) has been extensively used in west central Missouri for building purposes. The granites in southeastern Missouri have had wide acceptance in the monumental field. The Kimmswick, Little Saline, Grand Tower, Burlington, Keokuk, and Warsaw are all used in the marble trade.

Chats from the zinc mills in the Joplin district are extensively utilized for aggregates and abrasives. The chats are screened and the fine sands used for abrasives. The coarser fragments are used in oil mat and concrete aggregates. The chats from the lead mines in southeastern Missouri are extensively utilized for road aggregate, particularly with oil mat, and for agricultural limestone. The Joplin chats contain too much chert to be used for agricultural limestone.

The Barnsdall-Tripoli Co., Seneca, and the Independent Gravel Co., Racine, are operating mills for the grinding and grading of tripoli. Extensive deposits of this form of silica have been developed in southwestern Missouri and equally extensive deposits are known but undeveloped in southeastern Missouri.

The use of shales and loess in the production of ceramic ballast is now being tested. Pennsylvanian shales in the Kansas City area are used in the production of Haydite. Many shales and clays throughout the State have been found to be satisfactory for production of light weight aggregates.



Showing location of quarries, and cement, lime, and silica plants in Missouri

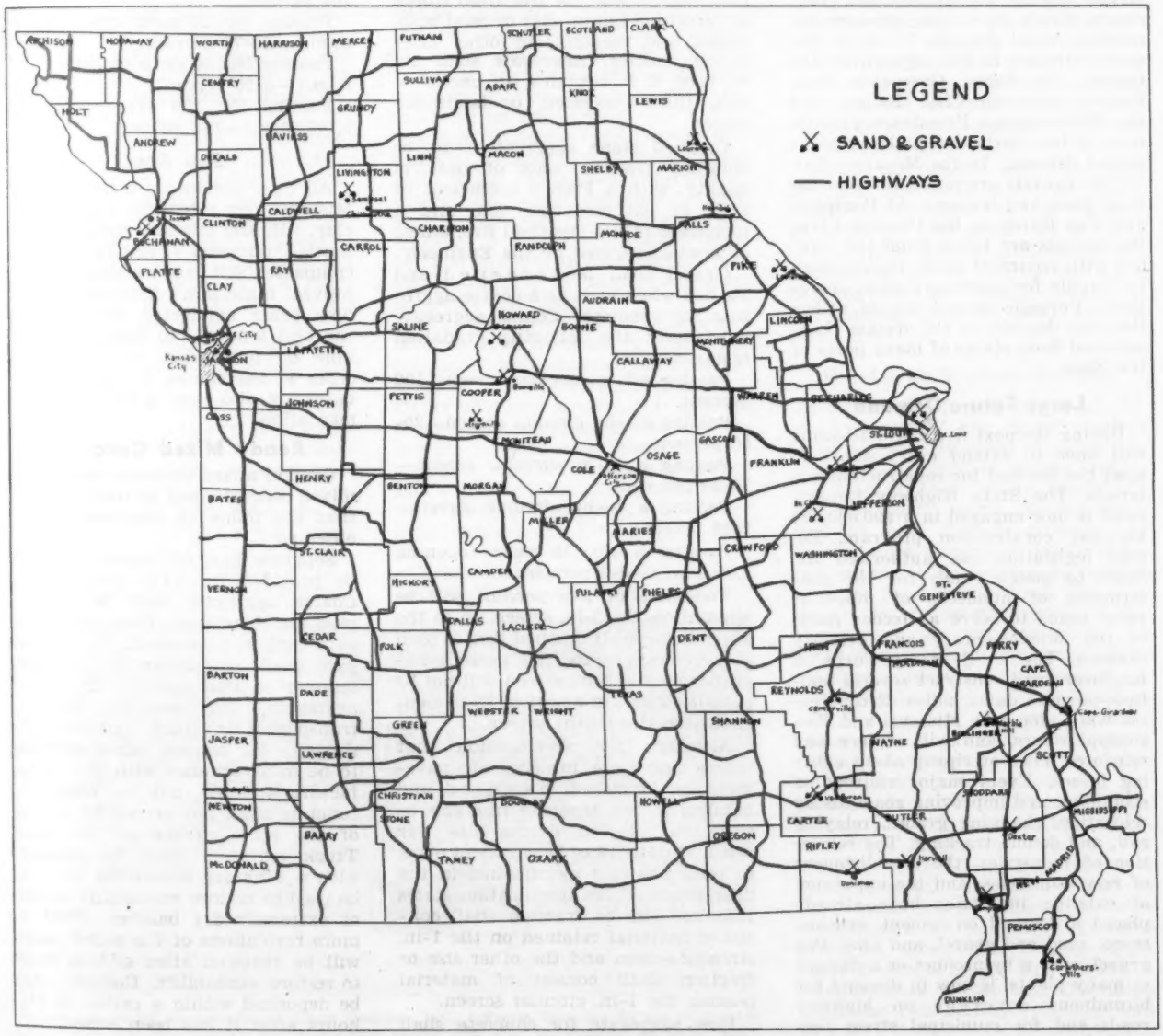
Different Gravels and Sands in Three Water Sheds

MISSOURI IS DRAINED into three watersheds. Fifty percent of the State drains into the Missouri River through its tributaries, the Osage, Gasconade, Platte, Grand, and Chariton. Thirty-five percent of the land area drains into the Mississippi River through its major tributaries, the Fabius, Salt, Cuivre, Meramec, and St. Francis. The extreme southern portion of the State, constituting only fifteen percent of the land surface, drains into the Arkansas River Basin through the Spring, White, Eleven Point, Current, and Black Rivers.

In general, the streams of the Ozark region have high gradients, are swift-flowing, and contain large quantities of chert gravels and small quantities of silt and clay. Streams outside the Ozarks generally have low gradients, contain much silt and mud and few gravel deposits. Locally where these streams cross sandstone regions, sand deposits of commercial grade exist.

The principal sandstone formations that locally give rise to sand deposits in the stream are the Lamotte (Cambrian), Roubidoux (Ordovician), St. Peter (Ordovician), and numerous sandstones in the Pennsylvanian system of rocks. In shale, clay, and glacial drift areas the streams carry such a load of fine silt and suspended clay that neither sand nor gravel deposits are common; and relatively few will warrant the excessive washing necessary to produce a commercial product. Glacial boulders and gravel deposits have been discovered. The Sampsel pit west of Chillicothe and the State Highway Department pit at LaGrange have been extensively developed. Sand bars and thick sand accumulations in the channels of the Missouri and Mississippi rivers have permitted the operation of large dredges.

The purity of the St. Peter sandstone and its continuous outcrop for more than 275 miles assures this portion of the Mississippi Valley an unlimited reserve of superior silica sand for many industrial uses. Missouri has an unlimited reserve of commercial sands and gravels present in the Mississippi, Missouri, Meramec, Current, and innumerable Ozark streams. The glacial gravels of northern Missouri are less accessible because of



Map of Missouri showing principal sand and gravel operations

the character of the glacial till or drift.

Glacial deposits are developed at Chillicothe and LaGrange. In the embayment area of southeastern Missouri extensive gravel deposits are located on ancient terraces such as Crowley Ridge. These gravels have been identified as the Lafayette gravels which occur farther south, but their exact correlation remains problematic.

River Deposits

With the exception of the sands from the Mississippi and Missouri Rivers and the gravel deposits at Chillicothe and LaGrange, the main sand and gravel deposits in Missouri have a local origin. Sandstone formations such as those named are eroded to produce sand bars in the rivers and river terraces. Cherty formations, particularly the lower Paleozoic dolomites and the Mississippian limestones weather to release chert fragments which on erosion produce extensive gravel deposits in all of the major streams in and adjacent to the Ozarks. The Potosi, Gasconade, Roubidoux, Jefferson City, Bailey, and the Mississippian limestones produce most of the cherts that make up these gravel deposits. In the Meramec Valley the gravels are produced from the flood plain and terraces. At Doniphan and Van Buren on the Current River the gravels are taken from the river bed with recurrent floods replenishing the supply for stationary plant operations. Portable gravel plants utilize the local deposits in the stream channels and flood plains of many parts of the State.

Large Future Demand

During the next five years Missouri will have to extend every effort to meet the demand for construction materials. The State Highway Department is now engaged in a $90,000,000 highway construction program. Recent legislation has authorized the State to match funds for the construction of hundreds of miles of rural roads to serve as feeder roads to the supplementary and primary systems. The U. S. Army Corps of Engineers will construct several multiple-purpose dams, miles of concrete sea walls along the Missouri and Mississippi rivers, and will replace and reinforce miles of riprap along existing levees. Every major railroad is rebuilding and improving roadbeds by relocation, changing grades, relaying rail, and double tracking. The relocation of industries, the establishment of new industries, and the expansion of existing industries have already placed a demand on cement, crushed stone, sand and gravel, and lime. Pea gravel, once a by-product or a discard at many plants, is now in demand for bituminous coverage on highway roads and for municipal street construction and improvements.

Highway Specifications

MISSOURI specifications state that all cement used shall be portland cement which shall conform to A.S.T.M. Serial Designation C150. As yet, no major use has been made of air-entertaining cement, since satisfactory results have been obtained with normal portland cement. Calcium chloride is used for curing of concrete as well as for clearing pavements of ice.

Coarse Aggregate

Coarse aggregate for concrete, as listed in the 1942 edition of the specifications, can be crushed stone, gravel, or crushed flint. All coarse aggregate must consist of sound, hard, tough, durable, and uncoated particles, with no shale, slate, coal, ochre, or other easily disintegrated materials. It must be free from frozen or cemented lumps, clay or mud balls, sticks, and vegetable or other deleterious matter. Aggregate shall not be used if it contains an excess of soft, thin, elongated, or laminated pieces.

Crushed stone aggregate must be obtained from a rock of uniform quality, with a French coefficient of wear of not less than six, and a toughness of not less than five, unless otherwise specified by the Engineer.

Gravel shall be screened and washed when used as a coarse aggregate for concrete. Coarse aggregate must meet the following gradation requirements:

Passing a 2-in. circular screen—100 percent.

Passing a 1-in. circular screen—30-60 percent.

Passing a ½-in. circular screen—15-25 per cent.

Passing a ¼-in. circular screen—0-10 percent.

Passing a No. 10 sieve (opening 2.00 m.m.)—0-3 percent.

Tolerance of five percent will be allowed on the 2-in. screen up to the 2½-in. screen. If crushed flint is used as coarse aggregate, five percent tolerance on the 2-in. screen will not be permitted and in addition, 85 percent shall pass the 1½-in. screen.

Although the specification that coarse aggregate for concrete pavement be furnished, handled and batched in two separate fractions or sizes was waived during the war years, the Highway Department plans to return to this specification in the near future. This specification states that one size or fraction shall consist of material retained on the 1-in. circular screen and the other size or fraction shall consist of material passing the 1-in. circular screen.

Fine aggregate for concrete shall not contain over two percent by weight of finely divided organic matter and finely divided clay combined, and not to exceed one half of one percent by weight of finely divided organic matter. Mortar briquettes made by the standard method with one part of Portland cement to three parts of fine aggregate must have a tensile strength at the end of seven days, of at least 90 percent of that developed in the same time by mortar of the same proportions and consistency, made with the same cement and Standard Ottawa sand.

Fine Aggregate

Gradation for fine aggregate is as follows:

Passing ½-in. circular screen—100 percent.

Passing ¼-in. circular screen—95-100 percent.

Passing No. 20 sieve (opening 0.84 m.m.)—40-70 percent.

Passing No. 50 sieve (opening 0.297 m.m.)—5-20 percent.

Passing No. 100 sieve (opening 0.149 m.m.)—0-5 percent.

Sub Base

All new pavements constructed in Missouri over subgrades consisting of clay, silt, and silt clay mixtures (potential "pumpers"), will have a 4-in. compacted sub base consisting of approved materials. Experiments are now being conducted to determine the best type of sub base: impermeable or permeable, thickness, and types of aggregates. Bituminous sub bases are also coming in for experimentation.

Ready Mixed Concrete

Central mixed concrete and transit mixed concrete may be used provided that the following requirements are observed:

Separate bins or warehouses shall be provided for storing cement. Coarse aggregate shall be kept in piles and bins apart from the aggregate used in other work. Fine aggregate shall be handled in the same manner as that specified for coarse aggregate. The concrete shall be transported in truck agitators, the capacity for central mixed concrete to be in accordance with the manufacturer's rating, but the volume of concrete shall not exceed 80 percent of the gross volume of the drum. Truck agitators shall be equipped with a tank for measuring water to be used to restore workability in case of extremely dry batches. Forty or more revolutions of the mixer blades will be required after adding water to restore workability. Concrete shall be deposited within a period of 1½ hours after it has been mixed.

For transit mixed concrete, the vol-

ume of mixed concrete shall not exceed 57½-percent of the gross volume of the drum. When transit mixers are used for mixing preshrunk concrete, the volume of mixed concrete shall not exceed 70 percent of the gross volume of the drum.

Mixing speed for transit mixed concrete shall not be less than six nor greater than 16 r.p.m. of the drum or mixing blades. Agitating speed, for central mixed concrete, shall not be less than two nor greater than six r.p.m. of the drum or mixing blades.

PLANT PRACTICES

MISSOURI is blessed with an abundance of limestone excellently suited for use as coarse aggregate for concrete construction as well as for other commercial uses. Many of the operations, especially around the Kansas City area, are mines, working a high-calcium limestone. In the middle and eastern parts of the State, where the high quality stone appears near the surface, open quarries are worked.

In addition to the production of crushed limestone for concrete aggregate and stone for secondary roads, some producers are manufacturing lime meal, finely ground stone for glass plants, agricultural limestone, and rip-rap.

Working a mine in the conventional room-and-pillar system, with a 14-ft. ceiling, the Kansas City Quarries Co., Kansas City, produces 600 t.p.d. of crushed stone, of which about 90 percent is used in a company-owned ready mixed concrete plant adjacent to the crushed stone plant. A four-compartment bin in advance of an open-bin storage system stores the 10 percent of commercial stone that is not used in the ready mixed concrete operations.

Mined stone is crushed in a 17½-in. Telsmith gyratory and elevated by belt conveyor to a 4- x 12-ft. triple-deck Pioneer screen superimposed above the four-compartment bin. Four commercial sizes produced on this screen, which has a split lower deck, are stored in the bin and oversize, above 1¾-in., is recrushed in a No. 8 Telsmith gyratory crusher. Provision has been made through chute arrangement to recrush the overflow from any compartment in the bin when full.

Delivered by bucket elevator to a belt conveyor, the recrushed stone is sized over a 3- x 9-ft. triple-deck vibrating screen, with the oversize, plus 1¾-in., going to a No. 2 Telsmith gyratory crusher for further processing. Crusher throughs return to the screen in closed circuit. The two sizes retained on the lower and middle decks are a finished product, and the minus ⅝-in. stone, passing the lower deck, is rescreened on a 4- x 8-ft. triple-deck Pioneer vibrating screen. Four finished sizes are produced on this screen.

Another mining operation in the Kansas City area is the crushed stone plant of the Centropolis Crusher Co., where the room-and-pillar system also is employed. During normal operation, 18 rooms are worked in a 14-ft. stratum of Bethany Falls limestone, overlain by shale, Winterset limestone and loam.

Stone, crushed in a No. 20 Superior McCully gyratory primary crusher, is processed into commercial sizes by three 4- x 10-ft. double-deck Robins Gyrex vibrating screens, a 4- x 10-ft. double-deck Symons horizontal vibrating screen, and two reduction crushers; a 5XB Gruendler hammermill and a 4-ft. Symons cone crusher. Sized stone is stored in a set of seven bins having a total capacity of 2100 tons.

Truck loading is handled at two stations, fed by a blending belt under the bins and another blending belt at the side of the bins. Stone fed from either of the seven bins discharges over a 42- x 60-in. double-deck Robins Vibrex screen, one at each station, superimposed above the truck loading bins.

Finely pulverized lime meal is produced at a separate plant by a 5-roll Raymond high-side pulverizer and bagged by a one-bag Bates sacker. This plant receives stone from the two bins in the main plant containing fines, via belt conveyor. Production is about 1200 to 1500 tons in eight hours.

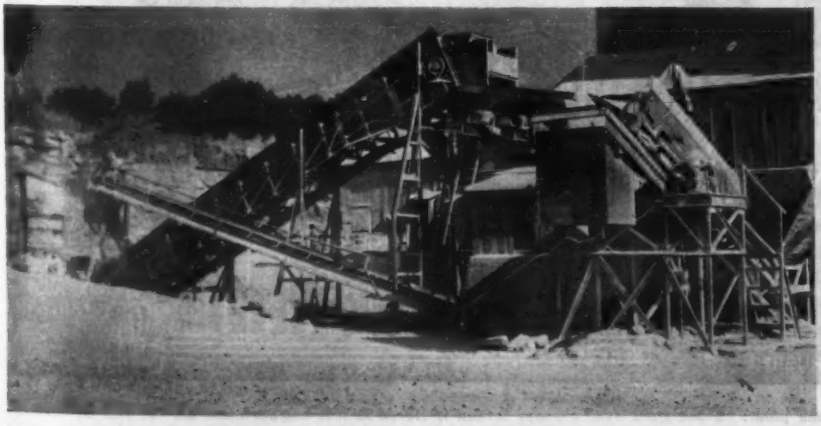
Typical of the mining operations in the Kansas City region is the plant of Frank Flinn Rock and Construction Co., working a 14-ft. seam of Bethany Falls limestone, also by the room-and-pillar system. Primary crushing is handled by a No. 6 Gates gyratory crusher; secondary crushing by a No. 3 Gates crusher; and sizing by two 3- x 8-ft. triple-deck Selectro vibrating screens above six bins, 115 ton capacity. Available for further reduction when desired is a set of 42-in. Webb City rolls that are fed from the secondary crusher and discharge to the bucket elevator feeding the screens.

Trucks are loaded under the bins through bottom-discharge gates. When stone is loaded to railroad cars on a nearby spur track, the stone is drawn from bins to a blending belt that discharges to a chute feeding a belt conveyor and bucket elevator to car loading bins. Capacity of this plant is 60 t.p.h.

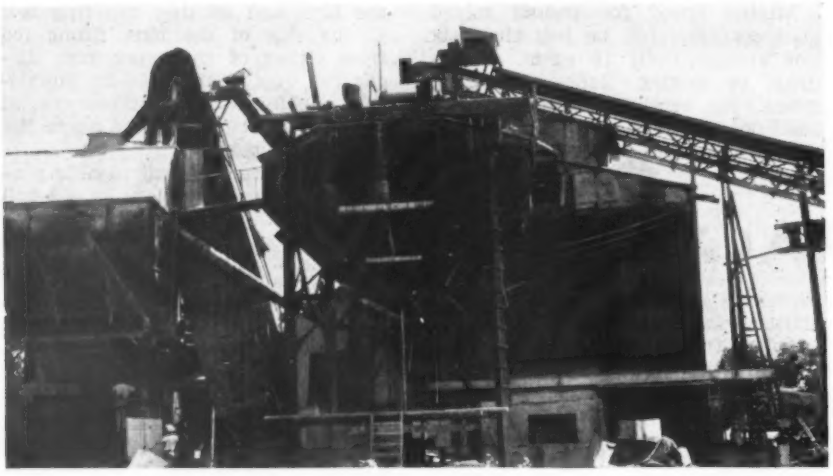
Use Large Trailers in Mine

Stewart Sand and Material Co. operates one of the larger crushed stone plants in Missouri at Independence. This is another mining operation with an 18-ft. ceiling, 30-ft. pillars and 35-ft. rooms. Recent addition of new Jumbo drifters has speeded up drilling from 12- to 18-in. per minute, thus helping to provide a larger load to the plant. Stone is hauled to the primary crusher, located near the mine entrance, by TR10 Easton side-dump semi-trailers carrying a 10-cu. yd. pay load.

Crushed in a No. 8 Austin-Western gyratory crusher, the stone is conveyed to a 4- x 12-ft. double-deck Robins vibrating screen where plus 2-in. stone is scalped off and recrushed in a 3-ft. Symons cone crusher and a 6- x 36-in. Allis-Chalmers Type R gyratory crusher. The product from the two reduction crushers returns in closed circuit to the primary screen. Minus 2-in. stone is conveyed to a series of three screening operations, located above eight 2-compartment bins having a total capacity of 1800 tons. Discharge from the belt conveyor is over two 4- x 8-ft. double-deck Allis-Chalmers screens through split discharge. Fur-



Rip-rap is produced mechanically at Bussen Quarries, Inc., Jefferson Barracks, by use of primary crusher with 9-in. jaw opening and double-deck screen with 6-in. sq. openings on upper deck. Plus 6-in. stone is sold as rip-rap and minus 6-in. stone is processed further for commercial purposes



Sized stone is stored in three bins at Auxvasse Stone & Gravel Co., Auxvasse. Above bin in center is horizontal screen. Oversize is piped to crusher in building in rear

ther screening is done on two 4- x 10-ft. and two 5- x 10-ft. Allis-Chalmers double-deck Ripl-Flo screens.

For further reduction, stone is drawn from bins through bottom-discharge gates to a blending belt under one compartment of the eight bins that discharges to a set of 24- x 42-in. Rogers rolls. The crushed product is returned to screening operations by bucket elevator. Under the other compartments of the eight bins is another blending belt that discharges to a loading tipple serving railroad cars. The product may be diverted at the loading tipple to another belt conveyor that charges three 75-ton capacity truck loading bins or two 100-ton capacity truck loading concrete silos. Production capacity of this plant is 200 t.p.h.

Portable Plants

Carthage Marble Corporation, Carthage, produces about 600 t.p.d. from spalls obtained from dimension stone operations. A Cedarapids semi-portable crushing and screening plant, augmented by an additional Cedarapids crusher and an extra screen is used. By opening the primary crusher to produce about 60 percent above 2-in., and recrushing in the extra crusher, a greater load can be sent to the screens and production increased. In addition, a Williams hammermill is available for recrushing when desired. The swinging belt conveyor that loads bins, trucks or railroad cars can also provide feed to this mill. The product returns through the plant and is re-screened after crushing in the hammermill.

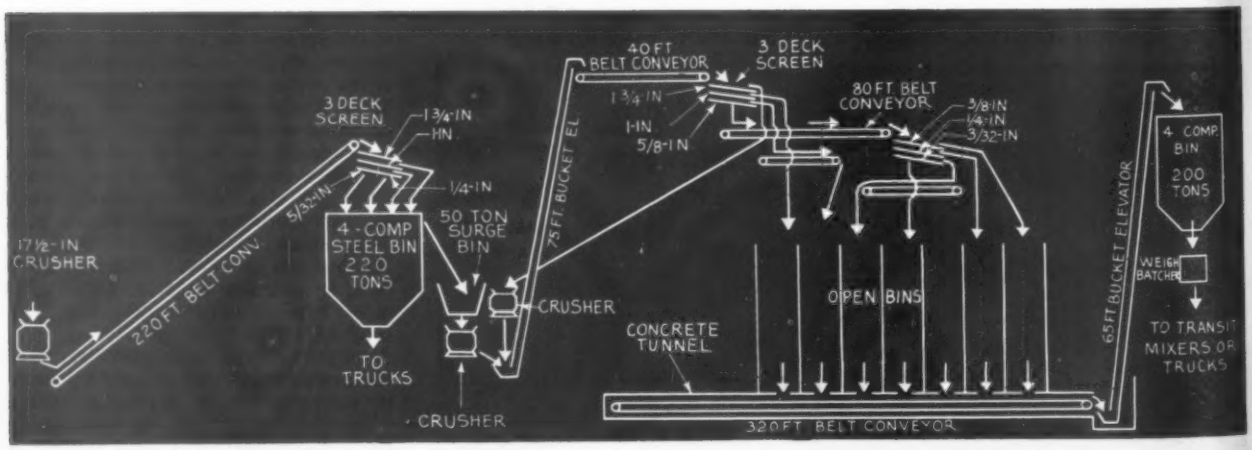
Reversing Belt Conveyors

Reversing belt conveyors through transfer stations has allowed the Garrett Construction Co., Springfield, to elevate stone to screening operations above bins and still utilize the advantages offered by belt conveyor transportation. Primary crushing is done in the quarry by a No. 13 Telsmith gyratory crusher. Conveyed from the quarry to a transfer station in the plant, the stone is taken on another belt conveyor for delivery to two Telsmith gyratory crushers. The product is conveyed through a transfer station to another conveyor, reversing the flow to gain the height desired in the limited space, to two 4- x 8-ft. single-deck Tyler Hummer screens in series. Stone is sized on these two screens and on two subsequent 4- x 7-ft. single-deck Tyler Hummer screens. Recent addition of a XXXB Gruendler hammermill under the bin containing 1¼- to 2-in. stone has allowed further reduction of this larger size. The product returns through the plant, fed by a belt conveyor under the crusher. Bin capacity is 350 tons.

Also located in Springfield is the Horton Stone Co., producing about 25 t.p.h. with five crushers and two trommel screens. Primary crushing is done in a No. 5 Telsmith or a No. 6 Gates, or both, the product discharging to a trommel screen for scalping oversize into an 8- x 24-in. Universal jaw crusher. The crushed product is elevated by bucket elevator to final screening in another trommel screen above storage bins. For reduction to agstone, the stone is chuted to a No. 2A Universal pulverizer or a set of 36-in. high-speed Rogers rolls, returning to the bucket elevator for re-screening. Minus ½-in. stone is conveyed from the trommel screen to a 4- x 8-ft. single-deck Universal vibrating screen for production of agstone.

Rock Hill Stone and Gravel Co., Rock Hill, near St. Louis, is producing about 1200 tons of stone per day, with about one-quarter of it agstone. The flow of stone from primary crusher to bins is a flexible and efficient operation, reaching its present

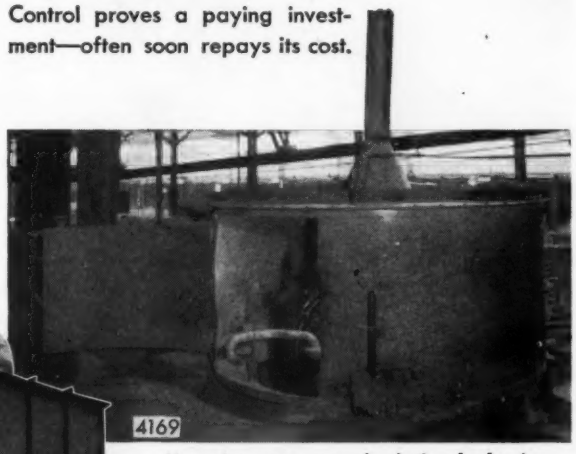
(Continued on page 106)



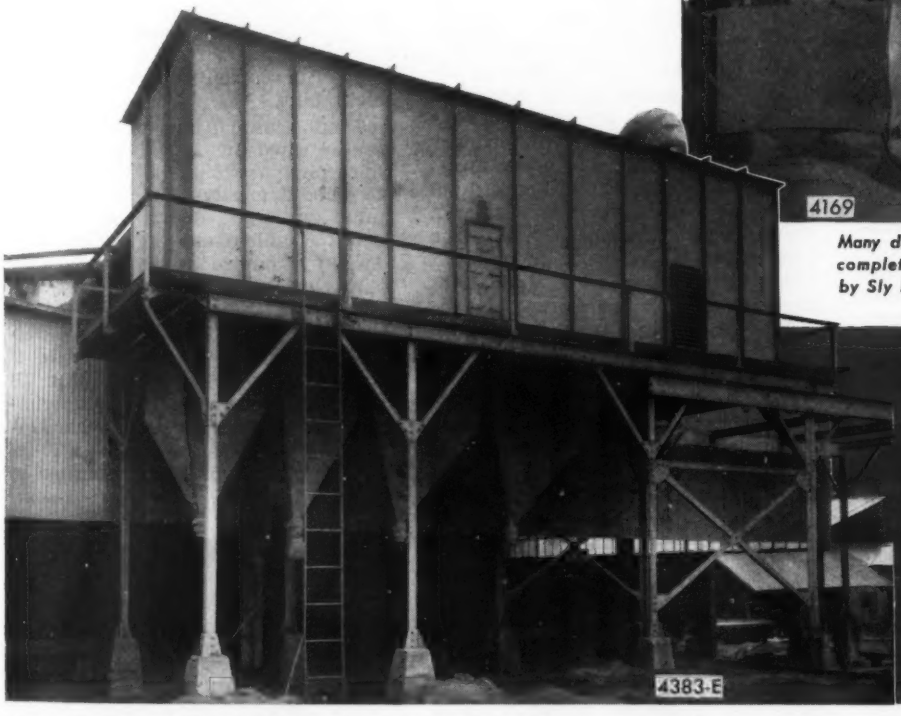
Flowsheet of Kansas City Quarries Co., crushed stone plant. Stone sized over primary screen is stored in four-compartment bin for sale as commercial stone, oversize and overflow from bins going to secondary crusher for reduction. Recrushed stone is elevated to screens superimposed above open-side bins. Blending belt under bins reclaims stone for introduction to a four-compartment bin above the company-owned ready mixed concrete plant. About 90 percent of the production is used in the concrete plant

SLY DUST CONTROL
A Paying Investment

Throughout the rock products field Sly Dust Control Systems are saving thousands of dollars yearly—by improving working conditions, eliminating health hazards, prolonging the life of machinery, reducing cleaning and maintenance costs, and recovering valuable materials. Because of these savings Sly Dust Control proves a paying investment—often soon repays its cost.



Many dry pans are made dustless by housing completely, as shown, and all dust collected by Sly Dust Filters (illustrated in top view.)



Sly Dust Collectors get all the dust by filtration through cloth. The Collector shown here filters silica dust out of 15,000 cu. ft. of air per minute.

Ask FOR BULLETIN 98

Ask for Bulletin 98, a 20-page illustrated publication giving important information about dust control and the advantages of the Sly method.

5 SLY SUPERIORITIES

1. Greater filtering capacity because of more filtering cloth.
2. Taut bags (patented) save power and improve dust removal.
3. Bags more easily replaced.
4. Automatic control (any degree) minimizes or entirely removes the human factor.
5. Simpler shaker mechanism results in savings in maintenance and operation.

THE W. W. SLY MFG. CO.

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Rock Hill Quarries, St. Louis, showing bench system of excavation with truck roadway leading to all ledges

form after years of experimentation. The primary crusher product from a No. 10 Superior McCully gyratory is conveyed by belt to a "ten-minute" surge bin. Stone is fed from this bin by a Webster pan feeder to a Williams Jumbo hammermill and a 4-ft. Symons cone crusher. The hammermill product is moved by a pan conveyor to a hopper with bottom discharge to the boot of a bucket elevator serving the main screening operations. The cone crusher product discharges directly to the hopper. Superimposed above storage bins is a 4- x 16-ft. Symons horizontal double-deck screen with split decks to produce five sizes. This screen receives stone from the bucket elevator. Minus ¾-in. stone is conveyed to secondary screening operations over a 4- x 12-ft. Tyrock triple-deck screen for the production of four additional sizes. Material passing the lower deck of this screen, minus ⅛-in., is fed through a hopper to a reversible belt conveyor that conveys the stone to a bin as screenings or, when the belt is reversed, to a 4- x 10-ft. Tyler Hummer single-deck screen equipped with 10-mesh screen cloth. The minus 10-mesh material is stocked as agstone and the oversize for concrete block manufacturers.

For the production of more fines, when desired, an auxiliary crusher is available. Fed from the bin containing 2-in. stone by a pan feeder, the stone is recrushed in an Allis-Chalmers 16- x 54-in. double-roll crusher and returned to the horizontal screen in closed circuit by belt conveyor.

Stone stockpiled in the storage yard is loaded into nine 40-ton hoppers by a Koehring crane. There is an individual hopper for nine sizes of stone to serve trucks.

Federal Materials Co., Cape Girardeau, is working an 18-ft. stratum of limestone below the old floor of the quarry. This quarry has a face of 300-ft., the highest in the State. Stone is elevated to the plant in 10-ton buckets pulled by an American Hoist. The buckets are pulled up vertically and dumped into the primary crusher, the full bucket going up as the empty one descends. Trucks haul the stone from the working area in the quarry to the hoist. Feed to the primary crusher is augmented at times by trucks hauling stone to a chute feeding the crusher.

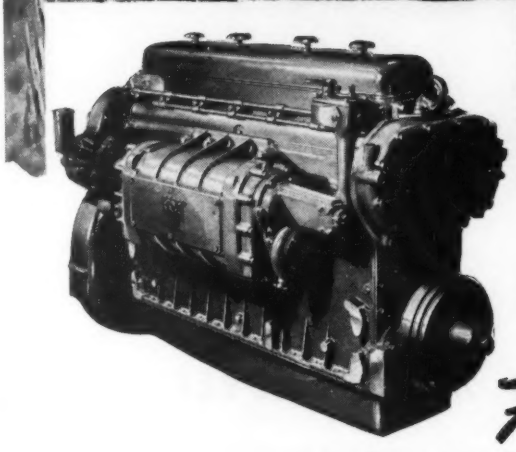
The primary crusher, a No. 12 Gates, discharges to a Link-Belt bucket elevator that transfers the stone to a No. 12 Allis-Chalmers trommel screen, 16 ft. long and 5 ft. in diameter, with a 6-ft. jacket. The screen is equipped with 2½-, 2- and 1½-in. openings and the jacket has ¾-in. openings. Plus 2½-in. stone is recrushed in a No. 8 Gates crusher; the 2- to 2½-in. stone is sold as railroad ballast; the 1½- to 2-in. stone is conveyed to a 4- x 6-ft. single-deck vibrating screen; and the ¾- to 1½-in. stone is stocked with the ballast to provide the fines necessary to make the proper blend. Minus ¾-in. stone is screened on the same screen that serves the 1½- to 2-in. stone. The oversize from this screen is a finished concrete aggregate and the minus ¼-in. stone is placed in the agstone bin.

Discharge from the No. 8 Gates crusher is delivered by bucket elevator to a No. 8 Allis-Chalmers trommel screen where four sizes are produced. Oversize is recrushed in a No. 6 Allis-Chalmers gyratory crusher, then elevated by belt bucket conveyor to a double-deck vibrating screen for the production of two more sizes. Overs from this screen are reduced by a 3-ft. Symons shorthead cone crusher and returned to the vibrating screen in closed circuit. Bin capacity is 1000 tons in eight bins.

Production capacity of 150 t.p.d. is concentrated in feed limestone and fines for glass plants at the Carthage Crushed Limestone Co., Carthage. A mine and open quarry are worked, about a mile from the main plant. Stone is hauled in 3-ton capacity skips by Brooks Load Luggers and crushed in a 6-in. Superior McCully primary crusher. Elevated by a Jeffrey bucket elevator, the stone is sized on a 3- x 8-ft. triple-deck VB Gyroset vibrating screen, superimposed above storage bins. Plus 1½-in. stone is recrushed in a 24- x 30-in. Jeffrey hammermill and returned to

(Continued on page 111)

Left: At Federal Materials Co., Cape Girardeau, stone is elevated from quarry floor in 10-ton buckets by 35-ton lift hoist to dump into primary crusher. Right: Ten-ton capacity bucket discharging over apron to crusher



CONTRACTORS—

For Great Diesel Power

take a look at Lumbering

THROUGHOUT the lumber industry a new kind of power is taking over. It is flexible power that can operate the whole mill—can drive pond drag, head saw, edger, trimmer, cut-off saw, conveyor and what-have-you. It is economical power—makes fuel costs next to negligible. It is sturdy power—responds immediately to increased loads. It is portable power—moveable to the next job with little fuss.

In short it is Series 71 General Motors Diesel power.

GM Diesels are 2-cycle. That makes them compact as well as powerful. They have clean design, unit injectors and Uniflow scavenging—making them clean-burning, efficient and easy to take care of.

These features make GM Diesels important to any industry.

* * *

So whatever needs for power you may have in road-making machinery, crushers, shovels or any other construction equipment—look to GM Diesels.

DETROIT DIESEL ENGINE DIVISION

DETROIT 23, MICH. • { SINGLE ENGINES . . Up to 200 H.P. / MULTIPLE UNITS . . Up to 800 H.P.

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GM GENERAL MOTORS DIESEL POWER

Features of GM Diesels Important to Every User of Power

- ***QUICK TO START*** on their own fuel
- ***ECONOMICAL***—run on low cost fuel
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- ***LESS FIRE HAZARD***—no volatile explosive fuel
- ***COMPACT***—readily adaptable to any installation
- ***SMOOTH OPERATION***—rotating and reciprocating forces completely balanced
- ***QUICK ACCELERATION***—2-cycle principle produces power with every downward piston stroke

MICHIGAN *Mobile* SHOVEL-CRANE

You can count on your operator maintaining high output rates with a MICHIGAN. It's fast-moving—both on the road and on the job. It's easy to handle, it's economical to operate. That's why it ranks so high in the estimation of operators and owners alike. With operators because its air controlled clutches respond instantaneously and smoothly to the touch of a finger. With owners because it gets every job done sooner, at minimum cost.

FULLY CONVERTIBLE
⅜ YD. and ½ YD. SHOVELS,
6 to 12 TON CRANES
•
FINGERTIP AIR CONTROLS
•
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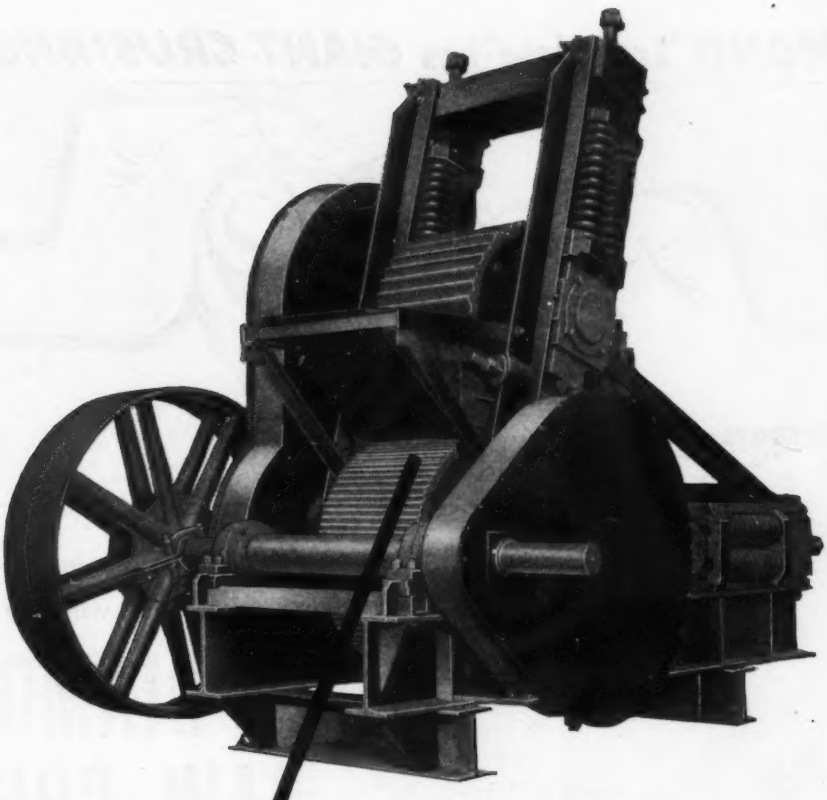
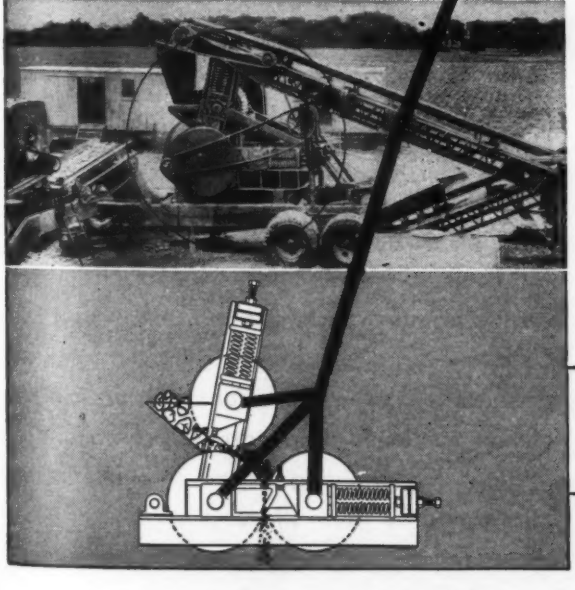
Complete information and specifications on MICHIGAN Mobile SHOVEL-CRANES are available on request. Ask for Bulletin RP-106.

MICHIGAN
POWER SHOVEL COMPANY
BENTON HARBOR, MICHIGAN



Revolutionary 2 in 1 Action...



THERE'S NOT an idle square inch on a roll crusher shell. With 100% of the shell surface a working surface, roll crushers have a larger capacity for fine materials than any other type of crusher.

Now, with the addition of a third roll, PIONEER combines the functions of 2 crushers in 1, greatly *increasing the stage of reduction.* The Triple Roll Crusher saves on original cost, operating expense, weight, space, and extra elevators and conveyors.

The two bottom rolls are 40" x 22" and the top roll is 34" x 22". The third roll assembly can be shipped complete with all attachments to those having a PIONEER 40" x 22" double roll crusher.

We'll be glad to give you full details on this new PIONEER Crusher with revolutionary 2 in 1 action.

"It's the best secondary crusher made," says Norman Roverud of Spring Grove, Minnesota. *Revolutionary 2 in 1 action.* Material first passes between the floating top roll and the driving roll. Then, without elevators or conveyors, it passes between the driving roll and horizontal floating roll.

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Engineers and Manufacturers of Quarry—Gravel and Mining Machinery

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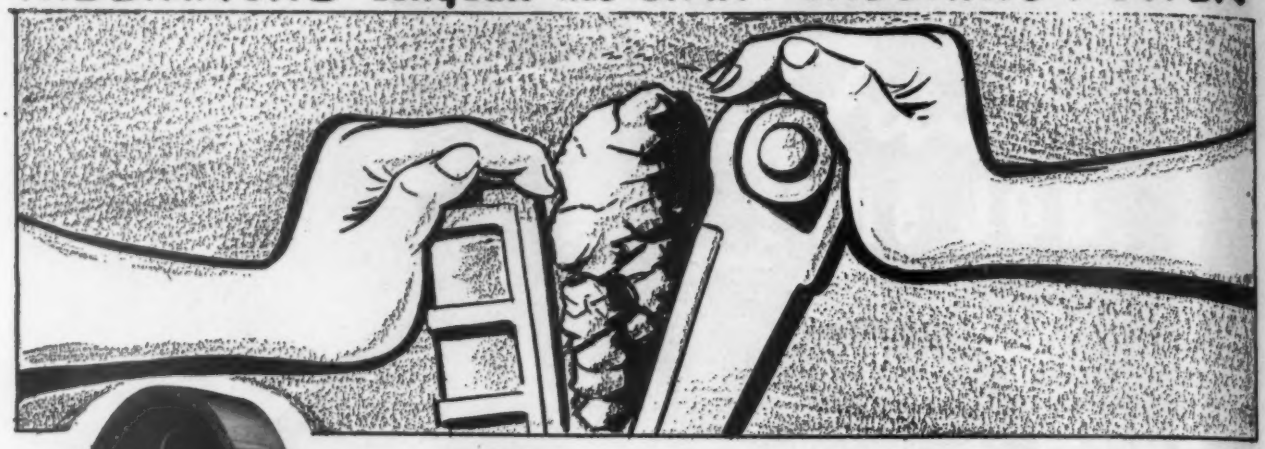
THE DIAMOND "Long Jaw" has GIANT CRUSHING POWER



Get Maximum Output

with the

DIAMOND JAW CRUSHER

The output of your primary crusher controls the output of the entire plant. A DIAMOND crusher on the job keeps screens, conveyors and elevators running at capacity, and keeps bins loaded. It will handle even the hardest rock and operates with a minimum of undersize and excellent uniformity of product.

The "Long Jaw" design of the DIAMOND means that the primary crushing effect at the top area of the jaw is a direct, smashing impact from the overthrow of the heavy eccentric shaft. The revolution continues downward and a combined crushing and grinding action throughout the entire jaw area takes place. A receding action follows and discharges the product on the underthrow of the eccentric.

MADE IN 10 SIZES

Write for Bulletin D-43-D which tells all about the ten DIAMOND sizes for every primary crushing need.

●

OTHER DIAMOND PRODUCTS

Jaw Crushers . . . Roll Crushers . . . Hammermills . . . Screens . . . Conveyors . . . Bins . . . Feeders . . . Portable and Stationary Plants.

"THERE'S NOTHING TOUGHER THAN A DIAMOND"

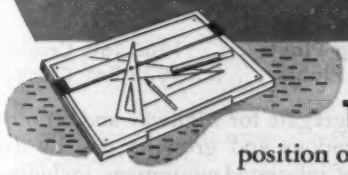
DIAMOND

DIAMOND IRON WORKS, INC.

AND THE MAHR MANUFACTURING CO. DIVISION

1800 SECOND STREET NORTH — MINNEAPOLIS 11, MINNESOTA

BUILT TO TAKE IT AND COME BACK FOR MORE



THE DOMINANT position of International Trucks in the heavy-hauling field results from just one thing—performance.

And the *performance* of International Trucks results from the way they are designed, engineered and built—plus more than 40 years of truck manufacturing experience.

Of great importance is the fact that new improvements and features are incorporated in Internationals as fast as they are proved worthy—without fanfare or boasting.

The result is that Internationals are constantly in the process of being better designed, better engineered and better built. And that means performance dividends for current purchasers.

No matter what your truck transport problem, there is an International to do the job, because the International Line is *complete.* Service facilities are unsurpassed, both from International Branches, the nation's largest company-owned truck-service organization, and thousands of International Dealers.

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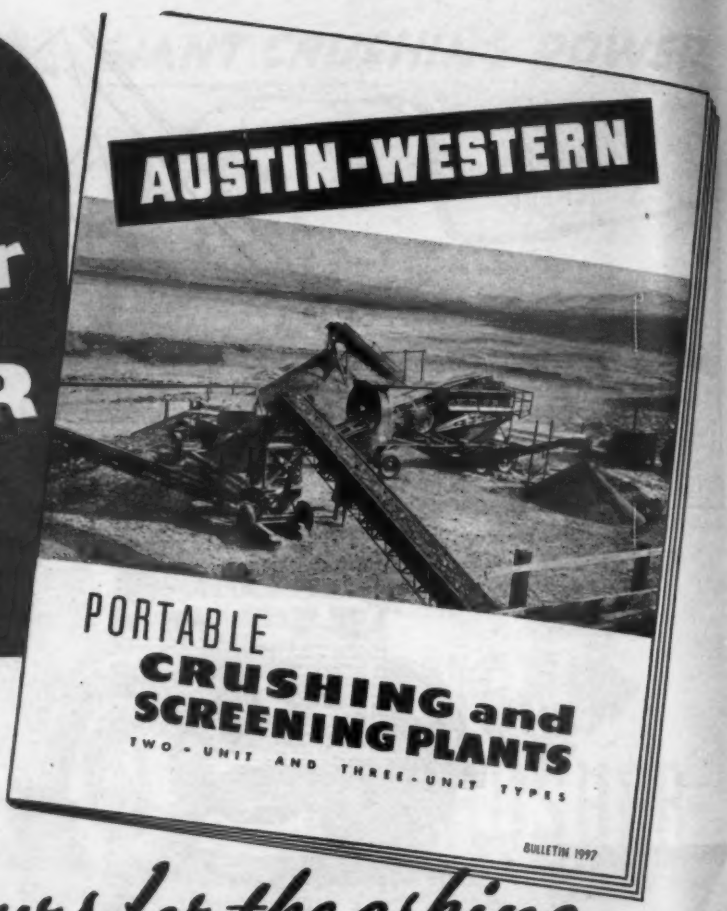
Guides to Greater POSTWAR Profits



Yours for the asking.

Copies of any or all of these interesting and informative bulletins. Ask for each by its number.

1999 Two-Unit and Three-Unit Crushing Plants . . . 1960 Jaw Crushers
1991 C. E. P. (Crusher, Elevator, Power) Plants . . . . 1933 Roll Crushers

● The Post-War demand for crushed aggregate for highway and all other forms of construction is already tremendous and growing day by day. Austin-Western is ready with a full line of job-tested equipment, including:

Jaw Crushers and Roll Crushers in a wide range of sizes; plus matching screens, elevators, conveyors and bins.

Portable Crushing Plants, from the smallest to the magnificent Two-Unit and Three-Unit Plants which combine maximum output and variety of specification on the one hand, and maximum economy of operation on the other; giving the owner flexibility of operation that spells maximum profits.

Your nearby Austin-Western dealer will be glad to recommend the plant best suited to your needs.

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U.S.A.

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12 *Advantages you buy* IN A FULLER CLINKER COOLER

1. Mechanical simplicity; requires comparatively little maintenance
2. Clinker moved as a flat inclined bed at uniform rate from chute to discharge end
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Before purchasing your next clinker cooler, may we suggest you get all the facts. We are confident, if you do, your selection will be a Fuller because, no other cooler will give you the many outstanding features and advantages such as listed on the left. Many installations now in service prove these facts, as do the many repeat orders coming in constantly from satisfied users.

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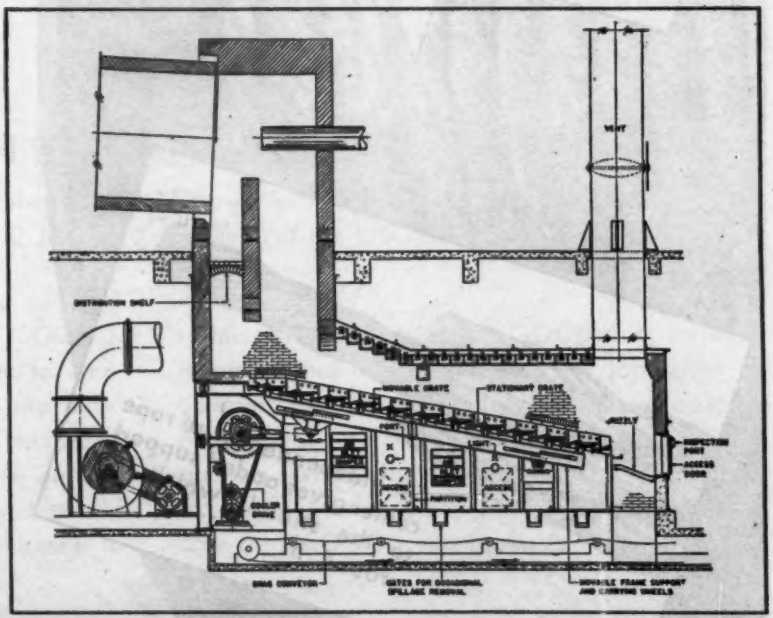

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CO-19

This Piece of Rope is Doomed

(NEXT TIME THEY'LL USE IWRC)

IWRC
would have helped
prevent this
An independent wire rope center gives added support to the strands which lie around it.

Too bad. It was a good wire rope, and it could have lived a long, useful life.

Instead, it's doomed to an early scrapping—and all because of crushing on the drum. The crushing was hastened by very poor spooling, which will shorten the life of any rope.

In some rope service, even with the best of spooling, it is difficult to avoid heavy, crushing pressures. But you can help counteract such pressures by purchasing rope with an IWRC (independent wire rope center).

An independent wire rope center is a separate little rope in itself—a rope within a rope. It performs the same duty as the conventional hemp core, but is naturally stronger, less yielding under pressure.

With IWRC, you may sacrifice a minor amount of flexibility. Nevertheless, where the hazard of crushing is present, IWRC should be specified. Under these conditions, it will substantially prolong rope life.

Why not review your roping needs with a Bethlehem engineer? If he finds you need IWRC, he'll recommend it—but only where it will actually work to your advantage.

BETHLEHEM STEEL COMPANY
Bethlehem, Pa.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

When you think WIRE ROPE . . . think BETHLEHEM

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75 YEARS *in the Making!*

The OSGOOD Type 100 is available as shovel, clamshell, dragline, crane and stripper. Write for your copy of the new Type 100 Bulletin.

THIS IS THE NEW OSGOOD TYPE 100

. . . modern from crawlers to point sheaves . . . a powerful new machine incorporating design and construction advancements never before available. Yet the OSGOOD Type 100 has been "on the boards" for 75 years!

For three quarters of a century, OSGOOD has designed and built equipment for the construction industry, pioneering improvements that have long since become standard. Today, the experience and know-how gained through 75 years of manufacturing dependable, economical-to-operate machines is reflected in this newest OSGOOD unit. Here is ample power for the toughest job, ease of operation that means more work per day, economy of operation that means more profit per job. Watch for the OSGOOD Type 100 . . . plan now to enjoy the advantages that only an OSGOOD can provide.

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CRANES, DRAGLINES AND SHOVELS
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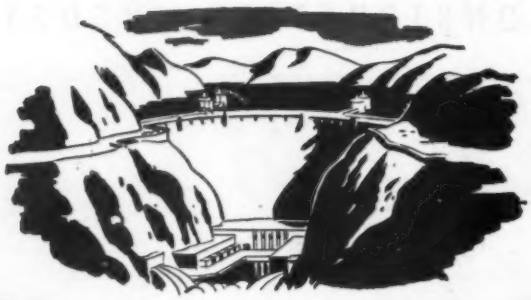

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For dependable, fast freight service always . . .

be Specific –
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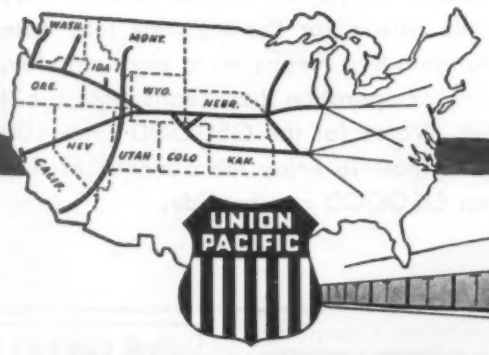

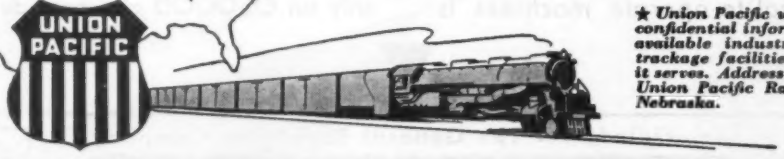

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The Strategic Middle Route

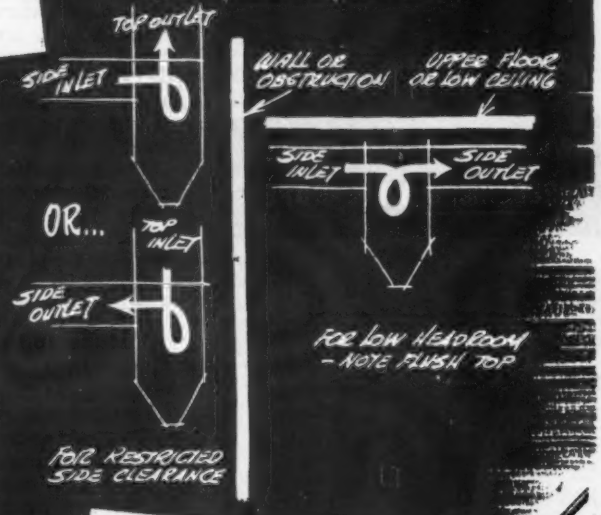
IN WIND, RAIN, SNOW OR HAIL • YOUR FREIGHT GETS THERE BY RAIL!

FLOOR SPACE COSTS MONEY—

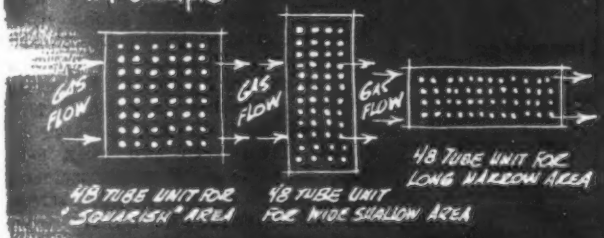
design your dust recovery installation for maximum compactness with

MULTICLONE!

FOR TIGHT SPACES you can easily adapt MULTICLONE inlet-outlet arrangement to your special requirements.

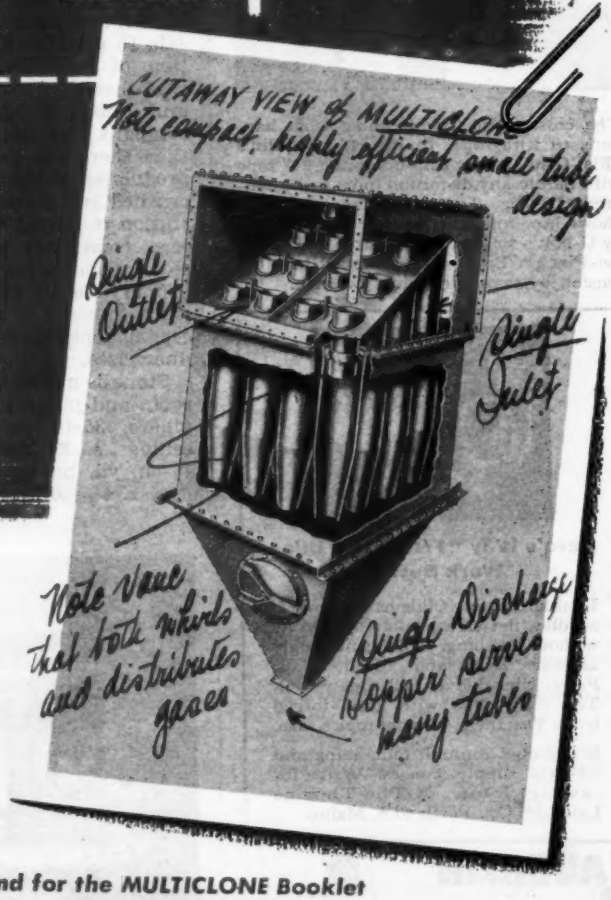


FOR ODD-SHAPED AREAS you can readily change the shape of the MULTICLONE - for example:


GAS FLOW
GAS FLOW
GAS FLOW
48 TUBE UNIT FOR "SQUARISH" AREA
48 TUBE UNIT FOR WIDE SHALLOW AREA
48 TUBE UNIT FOR LONG NARROW AREA

AND FOR ALL INSTALLATIONS the MULTICLONE itself requires less space than any other equipment of comparable performance.....

MAKE	RELATIVE SPACE REQUIREMENT IN SQ. FT.	IN CU. FT.
MULTICLONE	1.0	1.0
COLLECTOR A	2.1	1.8
COLLECTOR B	5.9	3.2
COLLECTOR C	6.8	3.9


CUTAWAY VIEW of MULTICLONE
Note compact, highly efficient small tube design
Single Outlet
Single Inlet
Note Vane that both whirls and distributes gases
Single Discharge Hopper serves many tubes

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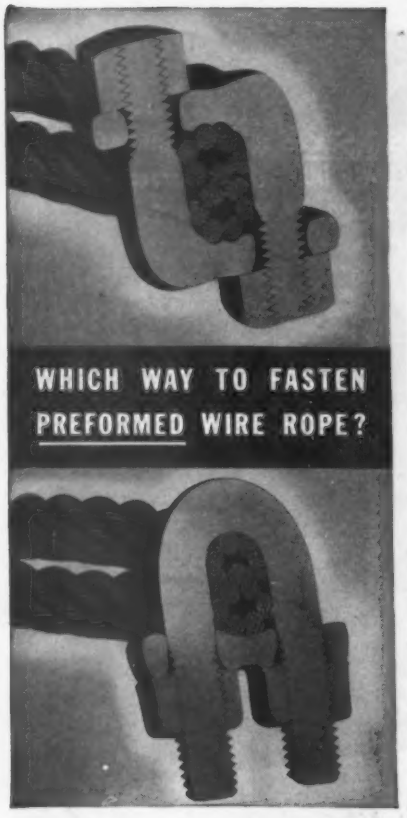

The cross-section views show what happens to wire rope. In Fig. 1, Laughlin's "Fist-Grip" Safety Clip holds the 5/8" rope with hardly any distortion (note hemp centers). In Fig. 2, hemp center under U shows how rope is squeezed and flattened by U-bolt's smaller bearing area and "Finger-Pinch". Both were tightened to same tension by torque-indicating wrench.

Here's Why "Fist-Grip" Clips Work Better

Laughlin Safety Clips have identical saddles, flat sides; hold rope firmly without crushing. Saddles fit snugly against "live" and "dead" ends. Fewer clips deliver full rope power. The only clips with drop-forged bolts. Test them, for your rope's sake.

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LAUGHLIN

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS

Operating Trends

(Continued from page 106)

the bucket elevator serving the screen, in closed circuit. Two bins are charged with the product retained on the two lower decks of the screen, from 3/16- to 1½-in. and ⅛- to 3/16-in. stone. Minus ⅛-in. stone is rescreened over a 3- x 8-ft. double-deck Jigger vibrating screen with 10- and 28-mesh screen cloth. Above 10-mesh is recrushed in the Jeffrey hammermill, and the products retained and passing the 28-mesh cloth is chuted to bins or directly to railroad cars.

For production of minus 200-mesh material, stone from the bins is conveyed by a screw which discharges to an enclosed bucket elevator to feed a 3-roll Raymond mill. Fines collected in a cone are placed in a dust bin.

Make Iodized Stone Meal

The crushed stone plant of the Independent Gravel Co., at Carthage, specializes not only in the production of concrete aggregate, road stone and agricultural limestone, but manufactures a lime meal, plain and iodized, as well as a finely ground product for sale to glass plants. The diversification of products necessarily means that there are a number of screening and crushing operations, and this company has laid out the plant so that there are five stations for the production of the various sizes. Stone crushed and screened at the primary station is routed to the other buildings from that point. In addition, stone is conveyed to bins from the primary station for sale as road stone when that size is not sent to the succeeding operations for recrushing to finer sizes.

Stone is mined in the conventional room-and-pillar system, with 20-ft. pillars, 35-ft. rooms, and a 17-ft. ceiling. A Koehring shovel with a ½-cu. yd. bucket loads trucks that haul a 4½-ton pay load to the primary crushing station. The trucks discharge into a 60-ton capacity hopper serving a No. 16 Telsmith gyratory crusher. A belt conveyor discharges stone over a 4- x 10-ft. Tyler-Niagara triple-deck vibrating screen with 2-, 1- and ¼-in. square openings on the three decks, respectively. Oversize is recrushed in a 30-in. Rogers hammermill and a 20-in. Cedarapids jaw crusher, the product returning to the screens by bucket elevator in closed circuit. The 1- to 2-in. stone either is conveyed to a truck-loading bin as commercial stone or is stored in a surge hopper serving screening and crushing operations in another building. The ¼- to 1-in. stone also is stored in the surge hopper or is conveyed to another truck-loading bin. Minus ¼-in. stone is stored in another surge hopper for feed to the "No. 20" mill, where the lime meal is produced.

Stone conveyed to the No. 20 mill is received in a surge box above a 4- x 40-ft. rotary drier. The dried product is crushed in a No. 4 Williams hammermill and elevated by bucket elevator to two 4- x 6-ft. single-deck Tyler Hummer screens, equipped with 10- and 20-mesh screen cloth split lengthwise on the deck. Fines, placed in a bin are conveyed to a truck or car loading hopper by belt conveyor. Oversize is recrushed in a Raymond three-roll mill, picked up by a No. 11 Raymond exhaust fan and blown into a bin. When iodized meal is produced, manganese, finely powdered, is fed into the Raymond mill by a Gump feeder at the rate desired. Iodine is mixed with water in a tank and fed into the mill through a needle valve. The product in the bin is conveyed to a two-compartment bin, one for plain meal and the other for the treated product. Under the bin is a movable two-bag St. Regis packer. Sacked meal is placed in storage.

Stone, ¼- to 2-in., conveyed from the bin at the primary station to a

(Continued on page 120)

After primary crushing, stone is processed in these three buildings as well as another not shown. All commercial sizes are produced and also a special iodized limestone meal, Independent Gravel Co., Carthage

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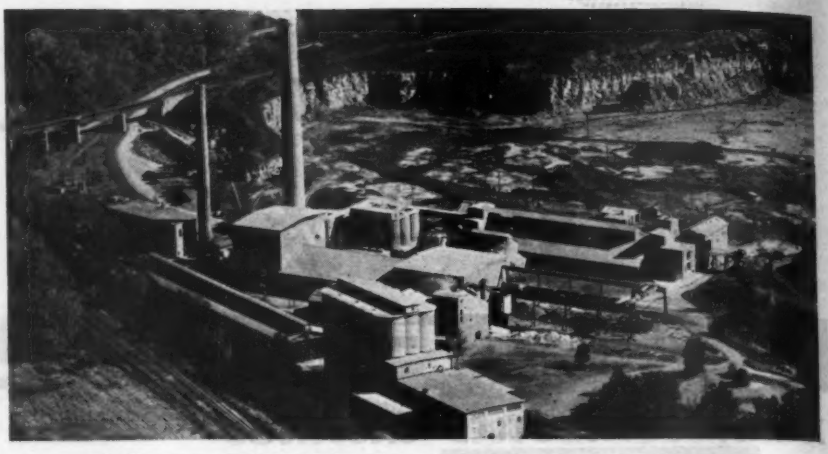

Looking down at Alpha Portland Cement Co. plant and quarry at Afton, Mo.

(Continued from page 118)

bucket elevator, discharges into a trommel screen that produces 1¼- to 2-in. stone, ¼- to 1¼-in. stone, and sends the minus ¼-in. material into a surge bin. The fines in the surge bin are conveyed to a set of 30-in. Traylor rolls for reduction. The product is transferred by bucket elevator to a 4- x 7-ft. double-deck Jeffrey screen with 3/16-in. square openings on the top deck and 10-mesh on the lower deck. Two sizes are produced on this screen, and the oversize is recrushed in a set of 18-in. Traylor rolls. The product is returned by screw conveyor and bucket elevator to the screen, in closed circuit.

Stone stored in the bins at this operation can be drawn into a chute that feeds the operations in an adjoining building. This stone, crushed in a 24-in. Jeffrey hammermill, is elevated by bucket elevator to a 4- x 5-ft. double-deck Leahy vibrating screen for the production of three sizes. Either size can be sent to the next building by spout or belt conveyor, for further processing. Fines for glass plants and agstone is produced here on a 3- x 5-ft. single-deck Leahy vibrating screen with 28-mesh screen cloth. Oversize is "glass sand" and minus 28-mesh is stored as agricultural limestone.

Production capacity of this plant, including agstone, "glass sand," live stock feed ingredient, road stone, concrete aggregate and seal coat aggregate is about 600 t.p.d.

"Machine Made" Rip-Rap

About 50 percent of a 1000 t.p.d. production of crushed limestone is mechanically-made rip-rap at the Bussen Quarries, Jefferson Barracks, Mo., during the period when the Mississippi river is at low stage. At other times, commercial stone is produced exclusively. Producing rip-rap mechanically and in volume is still a novelty in the crushed stone industry, and the method employed at this plant is not only different but efficient.

An open quarry and a mine are worked, and stone is transported to the primary crusher by 5-cu. yd. capacity Diamond T trucks after loading by a Marion electric shovel in the mine and a Link-Belt Speeder crane in the quarry. The primary crusher, a 25- x 40-in. Cedarapids jaw, underwent changes that made it suitable for producing rip-rap. The stationary jaw was placed on the same angle as the movable jaw and spacing was set at 9 in. By making this change and placing the jaws in a V-shaped position, it was found that less fines were produced. The attempt to produce stone ranging in weight from 25- to 175-lbs. with a minimum of spalls has been successful with this modification of the crusher.

The product from the crusher is conveyed by a Link-Belt pan conveyor to a 4- x 12-ft. double-deck Simplicity heavy-duty screen with 6- and 2-in. square openings on the upper and lower decks, respectively. About 50 percent of the feed to the screen is above 6-in., and this product discharges to a 25-ton capacity surge bin below the screen. Rip-rap is elevated to a steel truck-loading chute by a Stephens-Adamson pan conveyor, where trucks take the product and deliver it to a ramp for railroad car loading or to a dock for barge loading.

Minus 5- and plus 2-in. stone is recrushed in a Williams hammermill and returned to the pan conveyor feeding the screen by a Cedarapids belt conveyor. Minus 2-in. stone is delivered to the main plant for processing into commercial stone by a Cedarapids belt conveyor. This stone is elevated to screens superimposed above six bins having a capacity of 100 tons each. Carried by a Webster Manufacturing Co. bucket elevator, the product is sized on a 4- x 12-ft. Simplicity triple-deck screen and a 4- x 10-ft. Simplicity double-deck screen. The plus 1¼ and minus 2-in. stone is conveyed to further crushing in a 30- x 42-in. Williams hammermill or is stored as sized stone. Six

(Continued on page 122)

MATCHED EQUIPMENT

SPEEDS THE JOB

SIMPLIFIES SERVICE THROUGH A SINGLE DEALER ORGANIZATION

MAKES MORE MONEY

DIG—load—haul—dump! Here's an outfit that's making things hum at the slate-crushing plant of the Funkhouser Company near Delta, Pa. Equipped with Traxcavator shovel, a "Caterpillar" Diesel D7 Tractor loads an 8-yard Athey wagon made especially for rock hauling. A "Caterpillar" Diesel DW10 wheel-type Tractor then takes the load at a fast clip to the crusher, one-sixth of a mile away, and dumps it in one-third the time required with former equipment.

Working together in perfect harmony, these matched units handle a total of about 680 tons of slate rock per 8-hour day. During that period the two tractors together consume only about 17 gallons of low-cost fuel.

Using these facts as a basis, you can get a fair estimate of what such equipment can save *you* on material loading and hauling costs, as compared to the methods you are now using. Or, let your "Caterpillar" dealer help you do the "figgering."

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improves application and welding characteristics of
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*For HARDFACING all wearing equipment where Impact and Abrasion are involved.

FROM ALL OVER THE NATION come enthusiastic reports on ease and speed of applying the new Extrusion COATED STOODY SELF-HARDENING! This harder, more uniform coating brings improved welding performance: Slashes welding time, assures dense deposits, minimizes porosity!

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AC-DC APPLICATION—use either type machine. Amperage adjustment isn't fussy . . . good arc characteristics over a wide range! Can be deposited in any bead type or welded in any position.

NO CHANGE IN PHYSICAL CHARACTERISTICS—you get the same high wear resistance, same hardness—even on multiple passes!

GI[illegible] THE NEW COATED STOODY SELF-HA[illegible]ENING A WHIRL. You'll *like* the way it ha[illegible]les, you'll grin with satisfaction at results . . . for it's the same wear resistant metal that's won and held its place on merit for 20 years . . . now improved for easier, faster welding.

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STOODY HARD-FACING ALLOYS
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Operating Trends

(Continued from page 120)

sizes of commercial stone are produced in addition to the rip-rap.

Belt conveyor transportation in a straight-line flow between three processing stations features the new operation of West Lake Quarry and Material Co., Inc., at Florissant. Stone crushed in a 30- x 42-in. Pioneer jaw crusher is conveyed by an entirely-enclosed 30-in. Pioneer belt conveyor, 190-ft. centers, to the second station consisting of a 26- x 42-in. American pulverizer. From this point, stone is conveyed to screens above 12 bins in the third station for sizing. The stone receives final crushing at the second station, where the pulverizer is set to produce a top size, sold as a commercial aggregate.

Discharging from the second conveyor, a 30-in. x 180-ft. Pioneer, stone passes over a 4- x 12-ft. four-deck vibrating screen where four sizes are produced, the minus 1/8-in. stone passing to two 4- x 12-ft. triple-deck screens for further sizing. The four sizes produced on the latter screens are stored in the bins underneath. The 12 bins, with a capacity of 130 tons each, have bottom-discharge gates for truck loading. Capacity of this plant is about 150 t.p.h.

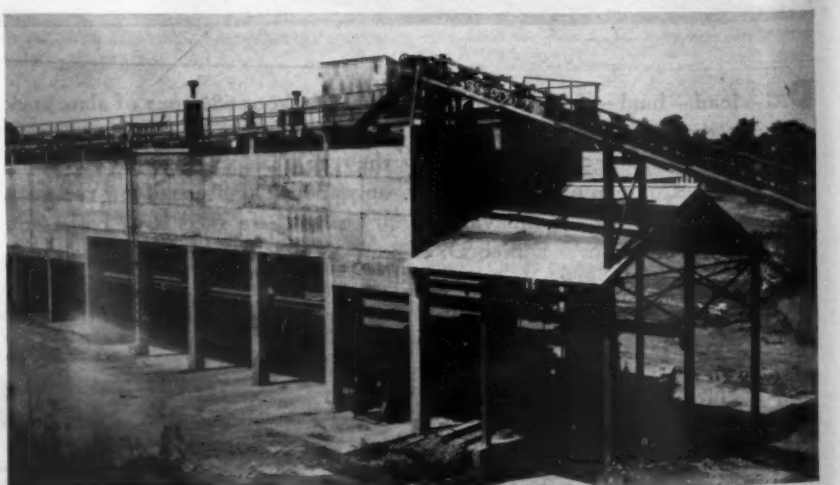
One of the newer crushed stone plants in Missouri is the Auxvasse Stone and Gravel Co. at Auxvasse, with new bins and equipment on the site of an old plant that stopped operations some years ago. The storage bins of the old plant is all that is retained, and all equipment now in operation is new.

Production capacity of 600 t.p.d., concentrated mostly in agstone, is handled by a 19- x 38-in. Austin-Western primary jaw crusher, a 9- x 36-in. Cedarapids jaw crusher, a 40-in. Williams hammermill, a 30-in. Williams hammermill, a 4- x 8-ft. double-deck Tyler Niagara vibrating screen, a 4- x 10-ft. Cedarapids horizontal screen, a 3- x 6-ft. single-deck Niagara screen, and a 3- x 6-ft. single-deck Universal screen. A complete article on this operation will appear in a later issue of ROCK PRODUCTS.

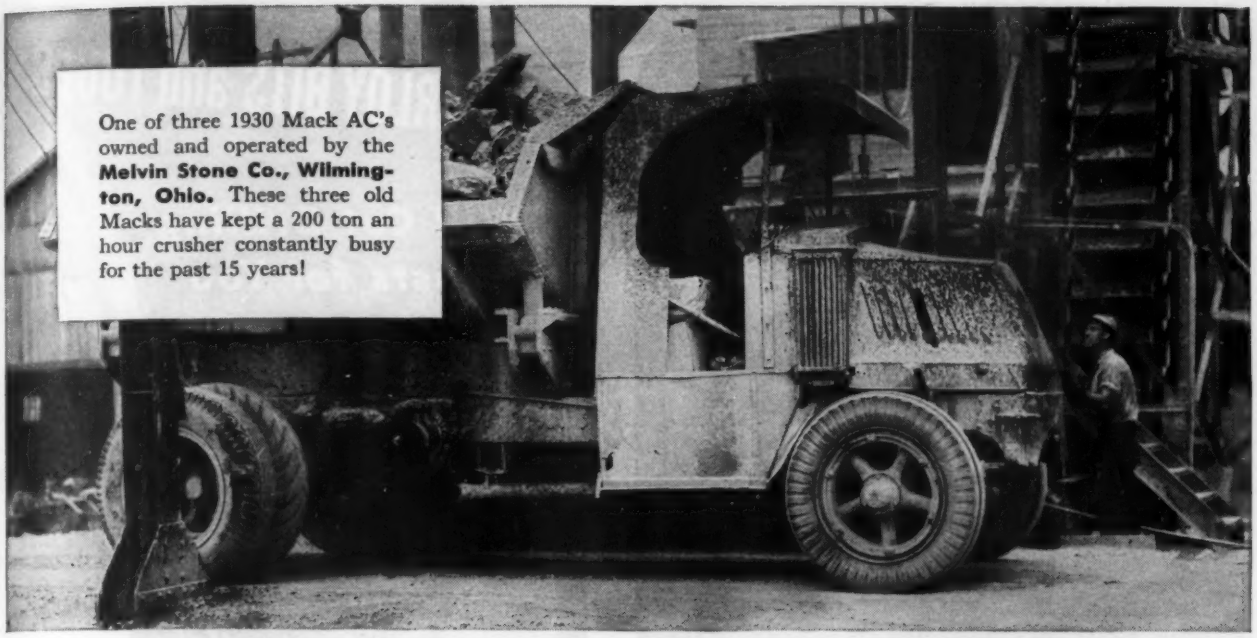
Working both mine and open quarry, Beyer Crushed Rock Co., Kansas City, produces about 800 t.p.d. of crushed stone from the Bethany Falls limestone member. Flexibility of operation permits recrushing of any size produced on a series of screens when finer sizes are desired. Stone crushed in a primary crusher, an Allis-Chalmers gyratory, is delivered by bucket elevator to screens superimposed above 15 bins, each of 75-ton capacity. Discharge from the elevator is over a 4- x 10-ft. triple-deck Selectro screen. Oversize, as well as the products retained on the two lower decks when desired, is recrushed in a Webb City roll crusher and returned to the screen inclosed circuit. When not recrushed, the products retained on the two lower decks is a finished material. Passing the lower deck, the stone is rescreened over a similar Selectro screen. Finished products are produced here, or the stone may be recrushed in the roll crusher. Side discharge chutes from the bins feed a blending belt that delivers the blended product to two bins for storage of special sizes.

Independent Gravel Co., Webb City, reclaims flint chat from zinc mining operations and processes it through screening, washing, and crushing stages to produce various grades of sands which are used on a wide basis for various uses such as sand blasting, roofing granules, concrete and bituminous aggregate. The chat produced is used for construction aggregates, railroad ballast, base course and surfacing. Production of this plant is about 10,000 cars yearly. In addition to the plant at Webb City, this company also operates plants at Joplin, Hannibal, Webb City, and a tripoli plant at Racine.

(Continued on page 121)



Ready mixed concrete batching plant of F. E. Breckenridge Co., St. Louis. Sand and stone is unloaded into bins from hopper-bottom cars, above. Auxiliary conveyor, to the right, fills bins at end used for ready mix when cars are not available



One of three 1930 Mack AC's owned and operated by the **Melvin Stone Co., Wilmington, Ohio.** These three old Macks have kept a 200 ton an hour crusher constantly busy for the past 15 years!

STILL SERVING..RIGHT BESIDE THE NEWEST!

Now working beside them is this new Mack LJ . . . doing its share of the job in 40% less time!

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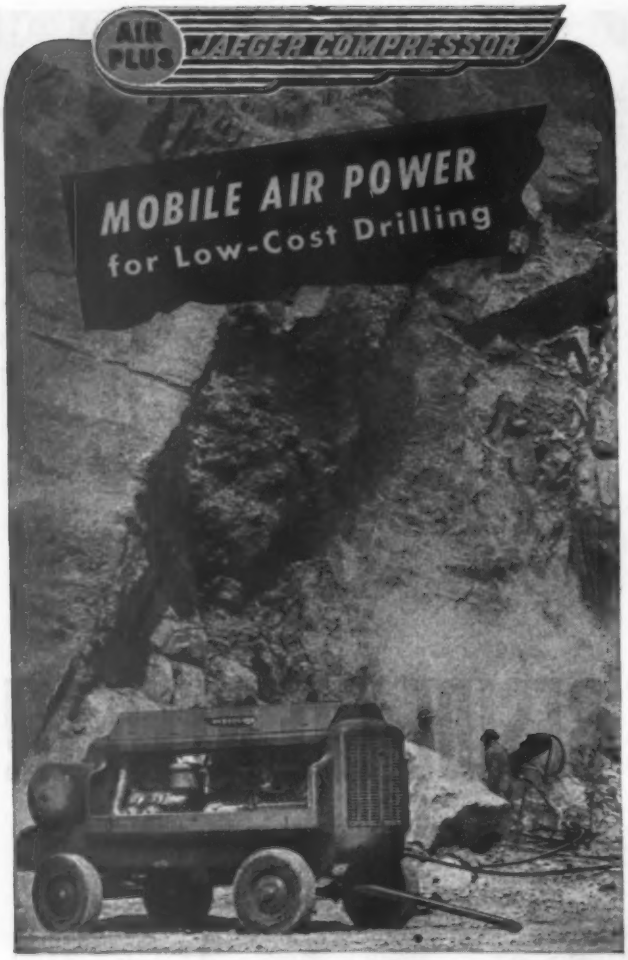

Out where new drilling begins, operators are often finding that the quick, economical way to get there is with Jaeger air-cooled portable compressors. Their rugged, modern trailer mounting (structurally welded frame, spring suspension, Timken bearings, big pneumatic tires, automotive steering) safely takes them wherever trucks can travel. Provides mobility and flexibility of air supply with a range of sizes up to 500 cu. ft. of free air per minute (ample for two wagon drills, as many as 9 rock drills), delivered at cooler temperatures and less cost for fuel and upkeep than you have ever thought possible.

Jaeger "AIR PLUS" Compressors are not to be confused with old-type portables. They are unit-engineered, precision built and balanced machines, with full force feed lubrication, 75% to 100% bigger valves, 20% to 30% slower piston speeds, 100% efficient air intercooling and 30% to 50% larger air receivers.

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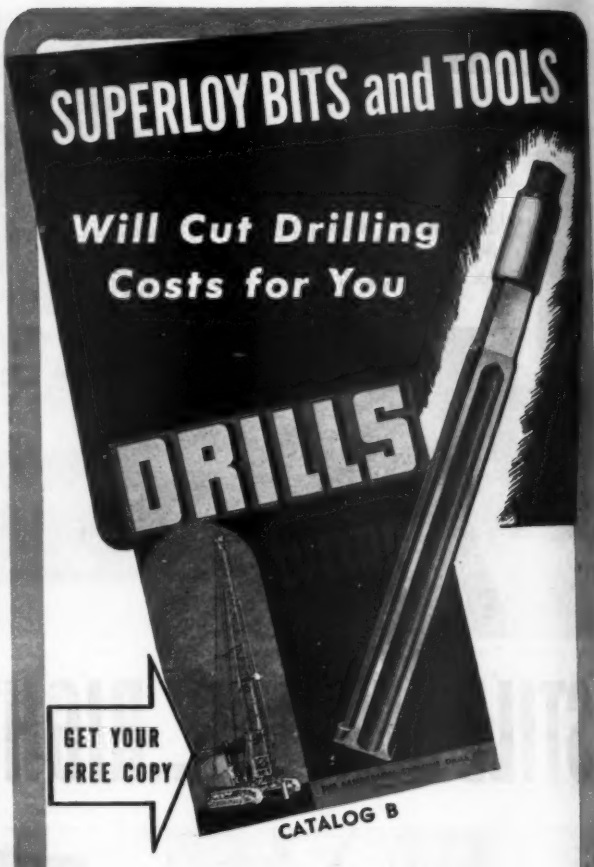

Superloy All-Steel Bits are made from a special analysis of steel, and are subjected to a heat treatment that makes them easy to handle... quick to dress. The cutting end is extremely hard without being brittle, and gives more footage per dressing. Superloy All-Steel Bits can be furnished for use in any make of Bit Sharpening Machine, and with each bit we send complete instructions for the blacksmith to follow in heating and dressing this new steel.

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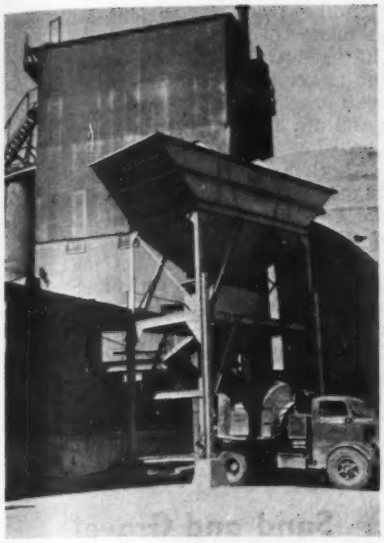


Fine sand, minus 100-mesh, in bin is measured by weigh batcher and added to transit mixer to produce federal specification concrete at Stewart Sand & Material Co. plant

Ready Mix Operations

(Continued from page 122)

Unusual in design and practice but proven efficient through years of operation is the ready mixed concrete plant of the General Materials Co. at St. Louis. Opposed to the gravity flow of materials through overhead bins, such as is evident in the majority of ready mixed concrete operations, this company operates "on the ground." Seven 100-ton capacity bins, each equipped with weigh-batcher, discharge to a flat bottom truck that carries aggregates to the central mixers or to a loading platform for transit mixers. The entire round trip for this yard truck is about 600-ft. An advantage with this type of operation is the diversity of aggregates that can be delivered to the mixers without changing the contents of the bins. Not only can seven sizes of aggregates be stocked in the bins, but

(Continued on page 126)

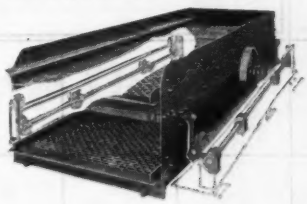
Product from blending belt at Missouri Gravel Co., La Grange, is fed to carloading belt. Material is washed in screen below surge hopper before going into cars

Here's Why Profit-Minded Operators Everywhere Choose SECO Vibrating Screens

There's a right SECO for your needs

More Tons Per Hour

1. Results count! Yes, day after day performance records piled up by Seco screens over the last eight years on all types of installations prove conclusively their ability to screen more tons per hour. Here's how.



Patented Equalizer Assembly

2. This basic engineering advantage makes the difference! Seco and only Seco has a fully controlled true circular action—that never varies—with less maintenance, keeps every inch of screen surface working at all times.

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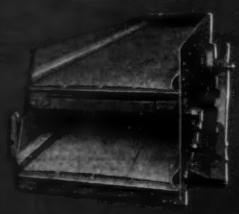
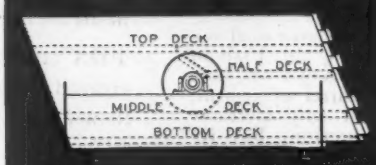
3. There's no lost motion—no slowing up of the load—blinding is kept to a minimum—and just think how much longer a Seco screen will hold up on the job with less maintenance—because there's no excess strain on any one part. Get more production per hour—per month—per year. Get a SECO!

SINGLE DECK



DOUBLE DECK

TRIPLE DECK



THREE AND ONE HALF DECK

To scalp a small amount of oversize and make 3 finished sizes as well as fines.

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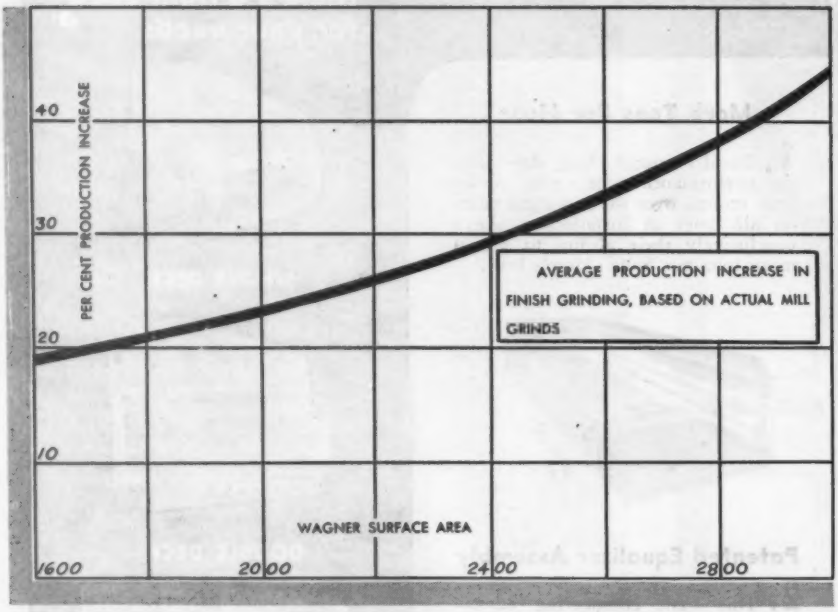
Screen Equipment Company, Inc.

9 Lafayette Avenue, Buffalo 13, New York

You can keep GRINDING COSTS DOWN *with* TDA

That's why over 50% of U. S. cement plants use TDA



TDA

WHAT IS TDA?

TDA is a catalyst-dispersing-agent used as a grinding aid. Used in amounts of 1½ to 4 oz. per barrel of cement, it not only increases production, but its presence improves many of the important properties of concrete, such as durability, strength, and impermeability.

TDA is being increasingly used to keep down grinding costs. On the chart you can find the average production increase in finish grinding which operators are obtaining in actual mill grinds. Some use TDA for special fine grinds, and others use TDA when bottlenecks occur in the finish grinding departments. TDA is widely used in making high early strength cements. And many plants use TDA in all their cement.

TDA is *not* an air-entraining agent, but gives increased durability to concrete where freezing and thawing in the presence of calcium chloride is not a factor.

You can use TDA with confidence. It is approved for use in cement and has been field-tested in over one hundred million barrels of portland cement.

Our engineers will be glad to work with you in making trial runs in your own plant. Write to the Cement Division of the Dewey and Almy Chemical Company, 65 Whittemore Avenue, Cambridge 40, Massachusetts.

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DEWEY AND ALMY CHEMICAL CO.
CAMBRIDGE 40, MASSACHUSETTS

blending from the various bins can be made through weigh-batcher into the yard truck. Cement is added to the mixer by bag. Provision has also been made to heat aggregates and water for freezing weather construction.

Another rather unusual ready mixed concrete operation is that of the F. E. Breckenridge Materials Co. at Webster Groves, where aggregates from a series of concrete overhead bins are weighed in a travelling weigh batcher before introduction to transit mixers. The weigh-batcher, specially designed by the Heltzel Co., weighs aggregates as well as cement in a three-compartment batcher. A complete article on this operation will appear in a later issue of ROCK PRODUCTS.

Sand and Gravel

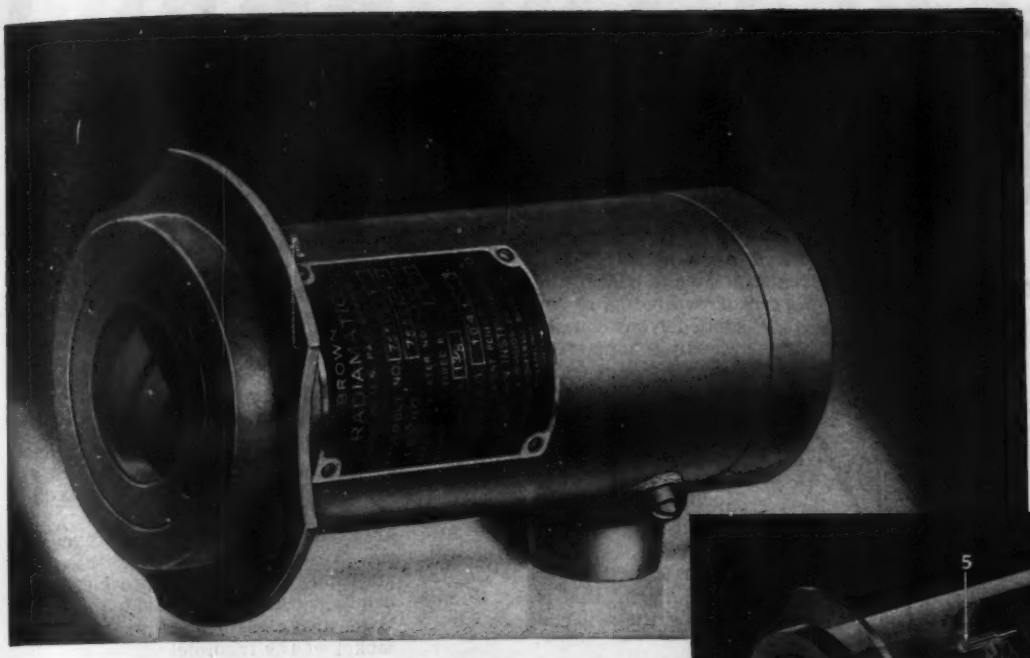
RIVER DEPOSITS are the main source of sand and gravel in Missouri, although there are two glacial deposits in the northern part of the State. Both the plant at La Grange, operated by the Missouri Gravel Co. and the plant at Chillicothe, operated by the Cooley Gravel Co. work a glacial deposit that yields a tough, sound gravel, as opposed to the chert gravels found in rivers. The major sources of river deposits are found in the Meramec and Current rivers, while several producers operate in the Mississippi and Missouri rivers for sand only.

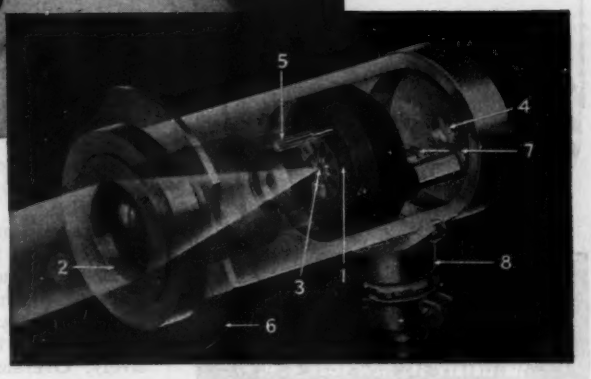
Although gravel is specified as a coarse aggregate for concrete, there are some types that are not specified for certain classes of concrete work, pending the completion of research work being conducted by the State Highway department. It is hoped that additional information obtained from this research work will permit the non-selective use of gravels in the near future.

While the chief objection to gravels obtained from other than glacial deposits is the cherty nature of the stone, the sands of the State also have trouble in meeting specifications. Sand recovered from the Mississippi and Missouri rivers contain lignite, an impurity that necessarily must be eliminated to allow the sand to pass specifications. This is accomplished by a large volume of wash water or by processing the sand in screw washers. Sands from these rivers as well as from the Meramec and Current rivers have an excess of fines in the plus 100- and minus 50-mesh size. Several unique methods of segregating this size have been developed and will be discussed further in this article.

Glacial deposits also present difficulties, even though the final product is excellent for concrete construction. Large amounts of clay appear in the deposits which require washing as well as picker belts to eliminate the impurity. These deposits also con-

(Continued on page 128)





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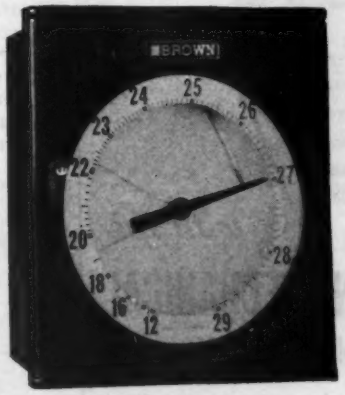

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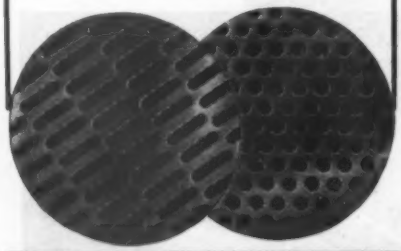

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Operating Trends

(Continued from page 126)

tain an excess of sand and much of it is wasted in order to recover the required amount of gravel.

Sand Classification

Stewart Sand and Material Co., Kansas City, has a very efficient method of collecting the sizes of sand desired by a series of Shaw classifiers on a dredge boat. Sand collected in each of two banks of seven classifiers is graded from coarse to fine in each succeeding cone. The sand is drawn from the cones containing the size desired for blending into the final product. Sand is wasted from the cones containing that size which is in excess. For example, the sand can be drawn from the first four cones and fines from the sixth cone to give a specified blend. The size in the fifth and seventh cones or any combination of cones is sent to waste as a size that occurs in the river to a greater degree than needed in the final product.

(Complete details covering this interesting operation will appear in a later issue.)

Pioneer Sand Co., St. Joseph, also dredges from the Missouri river, with a 10-in. Amsco pump. The product discharges over a double-deck gravity screen with 1- and ⅜-in. square openings on the two decks, respectively. Oversize from both decks is wasted back to the river, the top deck scalping the larger material and reducing the load sent to the lower screen. Minus ⅜-in. sand is distributed over a spreading table that feeds into a tub at the end of the table. The tub is 20 ft. long (the width of the spreading table) and about 3 ft. wide. In this tub are two gravity screens with square openings with mesh desired to produce the required sand size. Sand passing the lower deck is wasted back to the river while the oversize from ⅜-in. down to the screen openings on the lower deck, discharges to a 22-ft. launder with four small cones to collect the sand. Overflow is laundered back to the river with the sand collected in the four cones discharging through valves into the barge. This 22-ft. launder, swung perpendicular to the longer axis of the barge and immediately above it, allows even loading, since each of the four cones discharge to a different point in the barge. A 250-ton capacity barge can be loaded in 55 minutes.

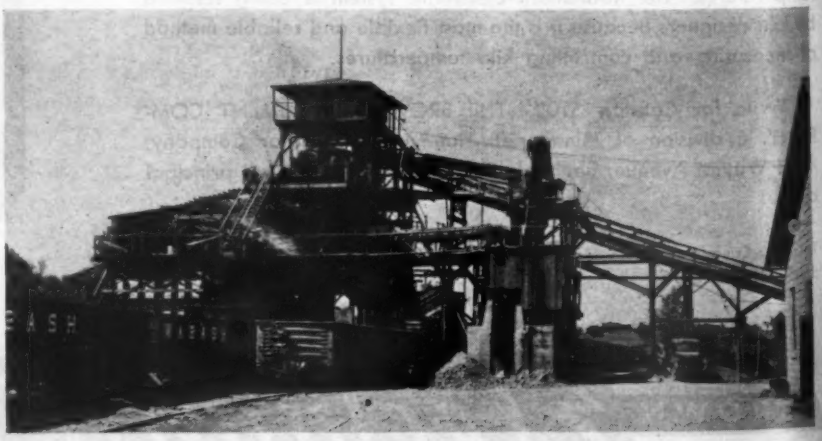
Operating for the past 20 years with this screening system, the company has found that specification sand can be produced satisfactorily, and that impurities such as lignite are washed away with the wasted fines.

Removing Clay from Gravel

Gravel sizing is made by trommel screen and a double-deck vibrating screen at Cooley Gravel Co., Chillicothe. The deposit, in the glaciated area, contains hard, sound gravel but the presence of clay necessitates the addition of wash water to clean the product. Sand is recovered in two sand drags. Sand passing the outer jacket of the trommel screen and the lower deck of the vibrating screen is chuted to the first sand drag. The product from this drag either goes to a bin or is sold as a material that does not require additional cleaning. When concrete sand is produced, the discharge from the first drag is chuted to a Harding mill that assists in breaking up the clay particles. The mill discharges to a rotary scrubber section, attached to the mill, with two revolving screen sections. Water is added through spray nozzles in the scrubber section and clay is washed away. The clean concrete sand is pumped to the second sand drag by a sand pump, the product from this drag going into a bin for sale as specification concrete sand.

Overburden at the deposit, consisting of a clayey material, is removed and wasted into previously worked areas, and the underlying sand and gravel is recovered by a drag line. The product is transported to the plant in Austin-Western side dump cars, pulled by 8-ton locomotives. Due

(Continued on page 130)



Conveyor at Chillicothe plant of Cooley Gravel Co., to the right, delivers material to trommel screen where sand is separated from gravel; to the left are sand drags for sand recovery

TOURNAPULLS lick TOUGH STRIP JOB

at Lincoln Sand & Gravel Co. pit

Tournapulls load saturated materials in 54 seconds over 75 to 100'.

100,000 yards of overburden had to be stripped to open lakeside gravel deposits for Lincoln Sand and Gravel Co., Lincoln, Illinois. These new deposits ranged from 60 to 80' in depth, contained varying grades of sand and gravel. Stripping contractor Lewis Shaw, veteran LeTourneau equipment owner from Decatur, Illinois, put 3 Tournapulls to work stripping the 4 to 6' overburden.

Wet Clay—Rough Job

Stripped material is spoiled on dump built out into lake. Constant rise in water level due to filling lake kept clay in the pit sticky and tough to handle. Due to wet conditions, exit from pit was rough, haul roads along shore had soft spots and clay fill made for tough hauling.

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Typical production, in spite of tough materials and rough conditions, showed the 3 Tournapulls made the 3500' round trip every 6.18 minutes . . . averaged 27 loads per hour.

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Shaw says, "I like the way they're working in the muck and wet materials on this job . . . they move a lot of dirt . . . that's good enough for my money."

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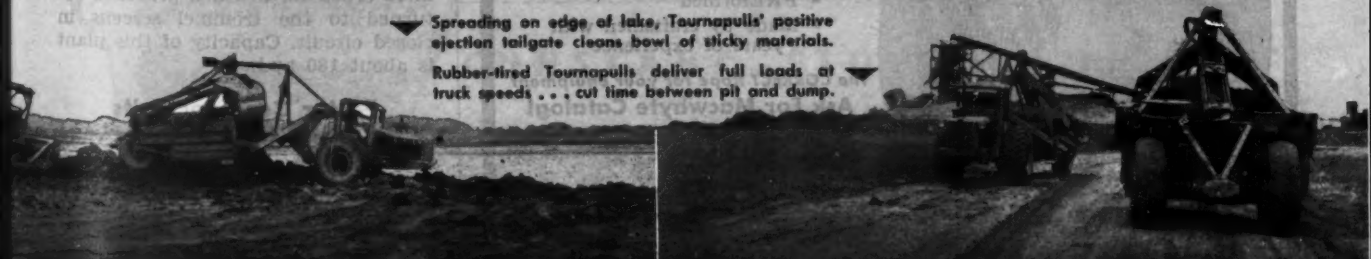
Rubber-tired Tournapulls deliver full loads at truck speeds . . . cut time between pit and dump.



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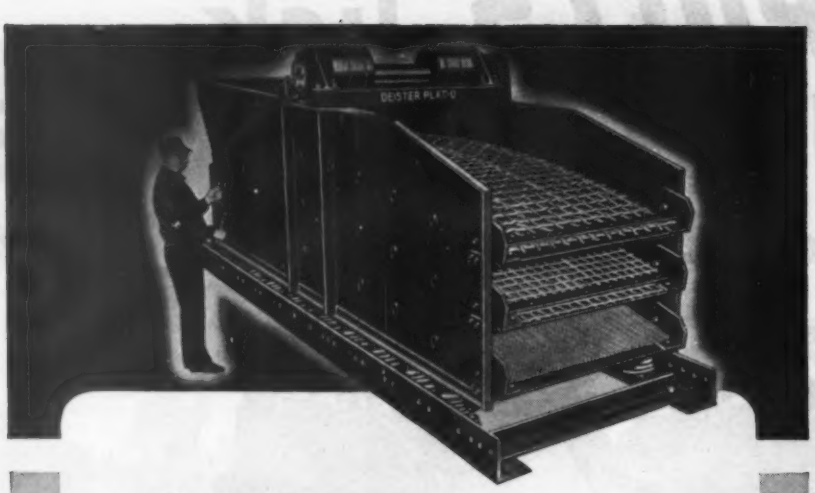

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(Continued from page 111)

to the presence of boulders, the product is scalped over a gravity screen with 4- x 6-in. openings and the oversize is crushed in an Acme jaw crusher before being conveyed to the washing and screening operations. Wash water, applied at the trommel screen and the scrubber section attached to the Harding mill, is supplied by two 6-in. Dainhill pumps.

Sand is pumped from the Missouri river by the Jefferson City Sand Co., Jefferson City, and sized by screen cloth in the chute that feeds barges. Oversize is laundered back to the river, and the desired size is recovered through the screen cloth in the launder. Barges are unloaded at a dock at Jefferson City by an American Hoist with clam-shell bucket. Capacity is about three barges per day.

Recover Glass Sand from River

St. Louis Material and Supply Co., Pacific, dredges from the Meramec river and tows the product in barges to the washing and screening plant where it is picked up by a stiff-leg derrick with a 2½-cu. yd. bucket and placed in a feed hopper. Gravel is sized in three banks of four trommel screens and three double-deck Deister Plato vibrating screens. Minus 3/16-in. sand, passing the lower decks of the vibrating screens is laundered to three Link-Belt cones, overflow going to waste. The sand contains an excess of fines, so the product from the cones is elevated to a single-deck Multirap screen equipped with 20-mesh screen cloth, to remove some of these fines. Sand retained on the 20-mesh screen is binned as concrete sand, and has been found to meet State Highway specifications satisfactorily, while the sand passing the screen, instead of being wasted, is laundered over two settling boxes equipped with 20-mesh screen cloth. The sand passing the 20-mesh is reclaimed and sold as "sugar" sand, for use in glass plants. Oversize launders to waste.

The river bank contains about 70 percent gravel, some above 2-in., therefore crushing is necessary. The first trommel screens are equipped with 1⅞-in. round openings with oversize collected in a bin that has a discharge chute to a belt conveyor for transfer to two 6-in. Allis-Chalmers crushers. Crushed gravel is returned to the trommel screens in closed circuit. Capacity of this plant is about 180 t.p.h.

Faster Conveyor Belts

• One of the newest sand and gravel operations on the Meramec river is the Denton Gravel Co., at Pacific. The deposit contains about 70 percent gravel, reclaimed by a 12-in. Morris pump, and pumped to a concrete

(Continued on page 132)

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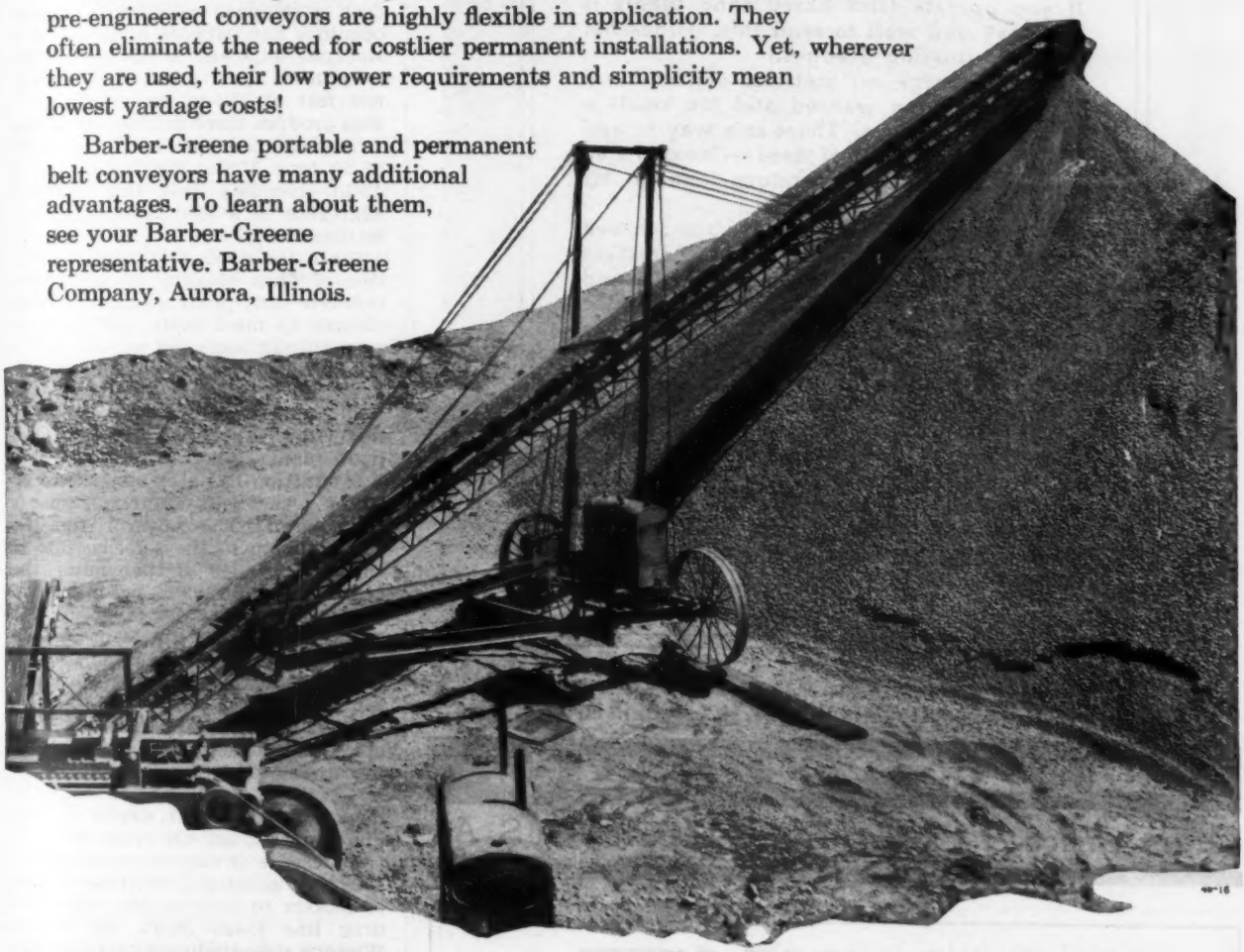

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Operating Trends

(Continued from page 130)

sump at the plant. The product, dewatered by a Link-Belt elevator with 30-in. buckets, is chuted to a surge bin. From the surge bin, a 24-in. belt conveyor discharges material over a 3½- x 10-ft. Cedarapids double-deck horizontal screen with 5/16- and ⅛-in. square openings. Minus ⅛-in. aggregate, chuted to a sand drag, is dewatered, cleaned, and then stored in a 100-ton capacity steel bin. The ⅛- to 5/16-in. gravel is stored and the oversize, above 5/16-in., is rescreened on another Cedarapids double-deck horizontal screen of the same size as the first one. The upper deck is equipped with 1¾-in. square openings and oversize is chuted to a stockpile adjacent to the plant. The lower deck has five feet of ⅞-in. and five feet of 1¼-in. square openings that produce three finished sizes. The four gravel bins each have a capacity of 50 tons. Under the five bins is a 42-in. blending belt that conveys aggregate to a loading belt for car loading.

Since the deposit contains an excess of fines (passing 50-mesh) the concrete sand produced still contains enough to meet State specifications even though some are wasted at the dewatering elevator. Wash water added on both screens at the rate of 1000 g.p.m. is sufficient to wash away impurities that are carried to the main plant.

Production has been stepped up by running the belts at greater speeds than normal. The conveyor from the surge bin up to the screens runs at the rate of 340 ft. per min.; the blending belt at 408 ft. per min.; and the loading belt at 492 ft. per min. A car of gravel can be loaded in 10 minutes, and a car of sand in 15 minutes. Production capacity is about 250 t.p.h.

Missouri-Illinois Material Co., Pacific, works a deposit near the Meramec river with a Class 420 Page dragline with a 5-cu. yd. bucket. The deposit, with a 32-ft. depth of sand and gravel is an old river bed, and the presence of clay necessitates considerable washing as well as the use of pickers to remove clay balls. The drag line loads 20-cu. yd. Austin Western side-discharge cars that are transported to the plant by a 40-ton Davenport-Bessler locomotive. Cars discharge through a grizzly spaced at 8-in. centers where large mud-and-clay-balls are removed. Under the grizzly is a recovery tunnel, 110 ft. long, housing a 30-in. belt that conveys the product to a 6- x 12-ft. triple-deck Robins Eliptex screen. Oversize, normally above 1⅛-in., conveyed by a 24-in. belt to a 125-ton capacity surge hopper, is crushed in two 9- x 36-in. Cedarapids jaw crushers and returned to the pit. The product from 1⅛-in. down to 3/32-in., retained on the middle and lower decks, is carried to the main screen-

ing plant by a long 24-in. belt conveyor. Sand, passing the 3/32- x 3-in. slotted openings on the lower deck, discharges to a sand drag. Sand is conveyed to a 125-ton capacity bin above spur tracks for car loading.

Five sizes of gravel are produced on three screens in the main screening plant. Discharge from the long conveyor is to a 5- x 12-ft. Robins Eliptex screen with 1⅛- and ⅞-in. square openings on the two decks. Oversize, above 1⅛-in., is a special "B" gravel. The ⅞- to 1⅛-in. gravel is also stored in bins. Passing the lower deck, the minus ⅞-in. gravel goes to a 4- x 10-ft. Symons double-deck screen with ½- or ⅜-in square openings on the upper deck and ¼-in. square openings on the lower deck. The product retained on the two decks is stored in two other bins, while the minus ¼-in. gravel goes to a single-deck 4- x 10-ft. Telsmith screen with 3/32- x 3-in. slotted openings. Oversize is stored while the fines are sent to waste.

Under the bins is a 30-in. blending belt feeding a tilting conveyor for car loading. This conveyor can be raised or lowered from the horizontal to 90-deg. to provide clearance for the cars.

Wash water, added at all screening points and at the two belt discharge points, is provided by Fairbanks-Morse 6-in. and 8-in. pumps operating against a 40-ft. head.

In addition to the thorough washing given to the product two pickers are employed at the primary belts to remove foreign particles. Capacity of the plant is about 250 t.p.h.

Two Pits—One Plant

Belt conveyor transportation from two pits to the washing and screening plant is a feature of the Missouri Gravel Co. at La Grange. Working two deposits in the glaciated area, the gravel is hard, sound, and durable. Although sand predominates, production is concentrated in gravel. Gravity screens at the pits are employed to screen out much of the sand, only the desired amount going to the main plant for recovery. In addition, a dewatering elevator is employed at the "West" pit.

Large Storage Facilities

St. Louis Material and Supply Co. operates an unloading station and storage yard for sand on the Mississippi river at St. Louis. Sand is dredged by contract and towed in barges to the unloading dock where the barges are unloaded by an electric gantry crane with a 2½-cu. yd. bucket. The crane loads a 25-ton capacity hopper that has bottom-discharge to a 30-in. belt conveyor, 250-ft. centers, for transfer to a 24-in. shuttle conveyor, 200-ft. centers, located above stockpiles. This conveyor, by horizontal movement, can unload to any point on the stockpiles below the 500-ft. trestle, 60 ft. high. Below the stockpiles is a re-

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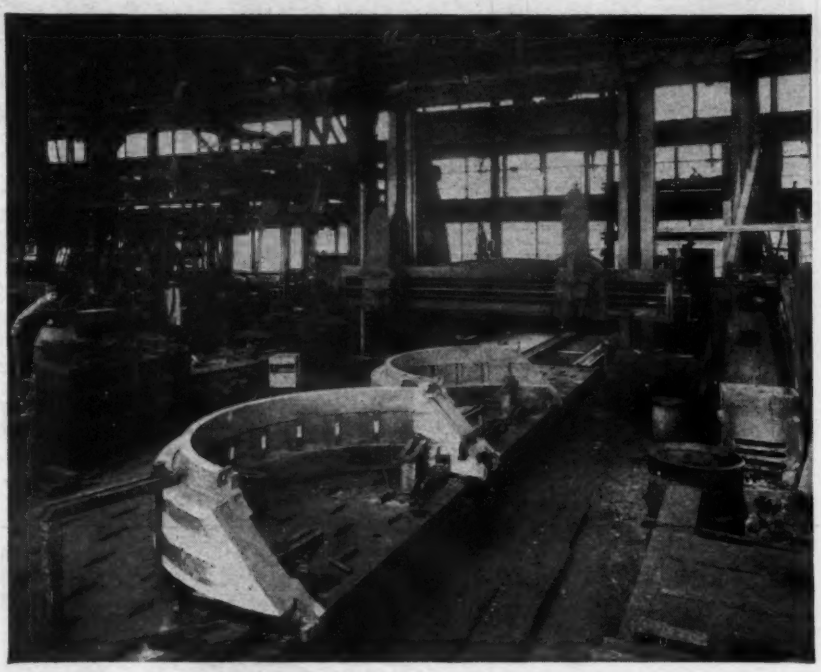

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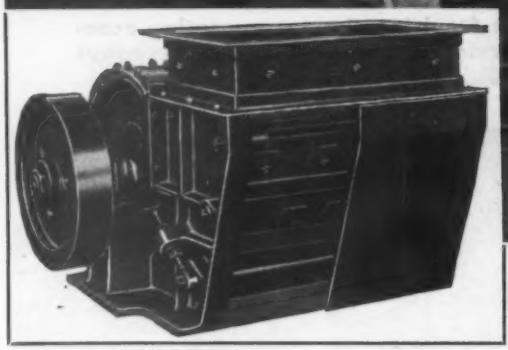

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covery tunnel housing two 30-in. belt conveyors, 250-ft. centers, that convey sand from the stockpiles to the center of the tunnel. The tunnel has 50 openings through which the sand feeds to the belts. The two belts, running in opposite directions to the center of the system, feed to a 32-in. car-loading belt conveyor, 200-ft. centers, that discharges to two steel tanks adjacent to the spur track.

Similar to the above operation is that of the Mississippi River Sand and Material Co., also at St. Louis on the Mississippi river. This company pumps from the river with a 16-in. Morris pump. The load is fed through a launder with screen openings as desired. Oversize is laundered to the river and throughs are sent to barges. At the unloading dock, the sand is picked up by a McMyler Interstate gantry crane with a 3½-cu. yd. bucket and loaded into a 30-cu. yd. hopper. A 30-in. belt conveyor transfers the sand to another 30-in. conveyor, 360-ft. centers for discharge to an 800-ton capacity concrete storage bin or to a series of stockpiling belts. Each of the three belts, in series, are 100-ft. centers, and each discharges to a different location in the stockpile area. The stockpile is above a recovery tunnel that houses a 30-in. belt conveyor, 320-ft. centers, that transfers the product to a bucket elevator conveying the sand to the main storage bin.

Three Conveyors In Series

Another operator on the Mississippi river is the Missouri-Illinois Material Co. also at St. Louis. Sand is dredged in various locations in the river by a 20-in. Morris pump and sand separation is made on the dredge. At the storage yard, the product is unloaded by a Stephens-Adamson electric gantry crane with a 2-cu. yd. clam-shell bucket into a 15-ton capacity hopper. Sand is transferred from the hopper to stockpiles by a series of belt conveyors, including a cross-conveyor at right angles to the main belt. A recovery tunnel under the stockpiles houses a pair of belt conveyors that feed to the center where the product is elevated by bucket elevator to a swivel chute for loading storage bins.

Working a deposit in the Current river, T. L. Wright at Doniphan, uses a Sauerman dragline with a 2-cu. yd. bucket to load a 20-ton capacity hopper at the plant. The hopper has manually-controlled feed to a 4- x 10-ft. double-deck Robins Gyrex screen. The product retained on the top deck, plus 1¼-in., is gravity-fed through a 20-in. diameter pipe to a 15-cu. yd. capacity hopper serving a 32B Telsmith crusher. The crushed product feeds to a surge bin above a ½-cu. yd. skip bucket that is drawn up a skip track on a 60-deg. angle to the hopper feeding the screen. The product retained on the lower deck is a sized gravel, and the sand passing the lower deck is reclaimed in a sand tank. Bin capacity is 200 tons for gravel and 100 tons for sand.

FINANCIAL

RECENT DIVIDENDS

Arundel Corp.	$ .25	Oct. 1
Canada Cement Co. Ltd. pfd.	1.62½	Sept. 20
Glens Falls Portland Cement Co. pfd.	1.50	Oct. 1
Kelley Island Lime and Trans. Co.	.20	Sept. 30
Peerless Cement Corp.	.25	Sept. 4

BESSEMER LIMESTONE & CEMENT Co., Youngstown, Ohio, has offered to exchange outstanding 6 percent cumulative preferred shares on a share-for-share basis for new 4 percent cumulative preferred by forwarding certificates to Dollar Savings & Trust Co., Youngstown, Ohio. Unexchanged 6 percent preferred has been called for redemption on October 1, at $50 a share, plus accrued dividends.

•

NORTH AMERICAN CEMENT CORPORATION, New York, N. Y., reported a net profit, after charges, of $35,490 for 12 months ended June 30, 1946. This compares with a net loss of $325,295 for the same period ended June 30, 1945.

•

PEERLESS CEMENT CORPORATION, Detroit, Mich., had a net income of $211,189 for the six months ended June 30, 1946 which compares with $72,988 for the first half of 1945.

•

THE WARNER CO., Philadelphia, Penn., showed a marked increase in net income for the first six months of 1946, reporting $452,132, which compares with a net income of $222,059 for the first half of 1945. A. D. Warner, Jr., vice-president of the company, stated that the company expected to do a larger business during the last half of 1946 than in the first six months. The company is spending $1,800,000 on an improvement and modernization program which is about two-thirds completed. Included in this program are 10 new 1000-ton steel barges. The company has built up a fleet of 140 vehicles engaged in hauling ready mixed concrete. For the year ended December 31, 1945, the company reported a net profit of $551,207 against $440,072 in 1944.

•

INDUSTRIAL SILICA CORPORATION, Youngstown, Ohio has announced that directors have approved a 10-for-one split of the company's 15,000 shares of $100 par 6½ percent preferred stock.

•

CONSOLIDATED CEMENT CORPORATION, Chicago, Ill., had a net profit of $89,167 for the six months ended June 30, 1946 as against a deficit of $80,957 for the first half of 1945. Net sales in the first half of 1946 were $1,763,351 as compared with $928,455 in the first six months of 1945. The company recently sold privately an issue of $1,000,000 first 4s due June 1, 1961 which will be used in part to redeem $871,600 first 6s, due 1950, and $90,200 6 percent notes,

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Cutting costs in dressing low grade ores can be accomplished only by finding entirely new processes or by definitely improving past methods.

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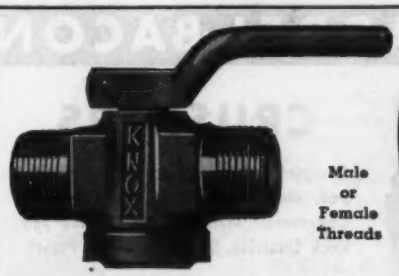
The Mine & Smelter Supply Co.



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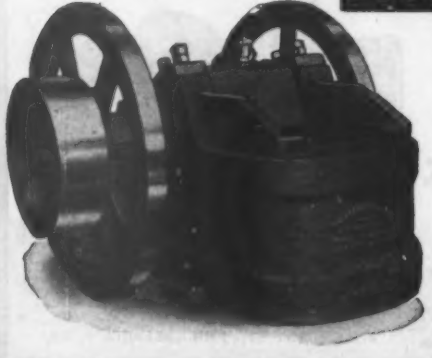

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due 1950, the balance to go to general funds.

•

UNITED STATES GYPSUM Co., Chicago, Ill., has presented the following consolidated earnings statement for six months to June 30:

	1946	1945
Operating profit	$9,654,943	$5,753,945
Deprec. & Deplet. ...	1,146,429	1,132,914
Net oper. profit	8,508,514	4,621,031
Other income	413,408	288,186
Total income	8,921,922	4,909,217
Income taxes	3,474,000	2,553,000
Net income	5,447,922	2,356,217
Preferred divs.	273,777	273,777
Common divs.	1,197,886	1,197,512
Surplus for period ..	3,976,259	884,928
Earn. surp., 1-1	36,040,829	33,754,453
Conting. reserve	.....	cr 876,766
Earn. surp., 6-30 ...	40,017,088	35,516,152
Earn., pfd. share ...	$69.65	$30.12
No. of pfd. shares ...	78,222	78,222

•

PACIFIC PORTLAND CEMENT Co., San Francisco, Calif., is reported to have purchased at $100 a share, 172 additional 6½ percent preferred shares for retirement, reducing outstanding amount to 37,313 shares. This transaction, together with 5,312 shares purchased for retirement in May, 1946, cancelled accrued unpaid dividends amounting to $270,239 and reduced future annual dividend requirements by $35,646.

•

COLONIAL SAND & STONE Co., New York, N. Y., earned net income of $233,023, after all charges and taxes, in the six months ended June 30, 1946. For the entire year of 1945, net income was only $127,739. Net sales for the six months to June 30, totaled $2,499,697, whereas sales for all of 1945 were $3,999,859. Unfilled orders on the books as of June 30, were approximately $6,522,000. Plants of the company have combined daily capacity of about 6,100 cu. yd. of sand, gravel and grit and 11,800 cu. yd. of concrete. Docks have a capacity of handling 21,000 cu. yd. of material (excluding mixed concrete) per 8-hr. day. Sixty-eight mixer trucks are operated. President Gereroso Pope recently announced the registration of 300,000 shares of common stock to be offered to the public by a syndicate headed by Emanual, Deetjen & Co., the stock being sold in equal proportions by the president and the company.

•

SIGNAL MOUNTAIN PORTLAND CEMENT Co., Chicago, with plant at Chattanooga, Tenn., reported a net profit of $198,759 for the six months ended June 30, 1946 which compared with a net deficit of $122,081 for the first half of 1945. Net sales for the first six months of 1946 were $1,313,196 as against $461,769 in the first half of 1945.

•

FLORIDA PORTLAND CEMENT Co., Chicago, with plant at Hookers Point, Fla., showed a net profit of $321,362 for the first six months of 1946 as compared with a net income of $100,065 for the first half of 1945. Net sales in the first six months of 1946 were $1,745,664 as against $1,520,489 in the first half of 1945.

•

LONGHORN PORTLAND CEMENT Co., San Antonio, Texas, reported a net

profit of $159,633 for the first six months of 1946. This compares with $45,075 for a similar period in 1945.

•

BLUE DIAMOND CORPORATION, Los Angeles, Calif., had a net profit of $206,000 for the six months ended June 30, 1946. This compares with $61,000 net income for the first half of 1945. Net sales in the first half of 1946 were $3,621,023 as against $2,570,252 a like period in 1945.

•

ALPHA PORTLAND CEMENT CO., showed the following earnings statement for the years ended June 30:

	1946	1945
Net sales	$9,583,471	$5,303,527
Oper. expenses	7,877,677	4,846,323
Deprec. & Deplet.	536,238	516,484
Operating profit	1,169,556	*d* 59,280
Other income	116,329	143,470
Total income	1,285,885	84,190
Income charges	71,261	1,097
Fed. income tax	434,079	.....
Net profit	780,545	83,093
Common divs.	591,356	591,356
Surplus for per.	189,189	*d* 508,263
Prev. surplus	2,749,764	3,198,027
Wartime reserve	*cr* 200,000	.....
[1]Credit	.....	60,000
Surplus	3,138,953	2,749,764

[1] Claim for refund of Federal income taxes based on carry-back of net loss for 1944.

•

NATIONAL GYPSUM CO., Buffalo, N. Y., showed the following statement of consolidated earnings for the six months' period ended June 30:

	1946	1945
Net sales	$16,057,705	$13,963,217
Cost of sales	11,616,626	11,288,258
Selling, etc., expense	1,722,527	1,465,770
[2] Oper. profit	2,718,552	1,209,189
[1] Other income	349,346	190,235
Total income	3,067,898	1,399,424
Interest, etc.	138,405	104,859
Doubt. accts., etc.	43,617	15,278
Other deductions	85,158	94,628
Income taxes	1,073,500	665,100
Net profit	1,727,218	519,559
Earn., pfd. share	$21.000	$8.00
No. of pfd. shares	82,250	64,980

[1] In 1946 includes war contract termination fees, $34,733 for both periods; and marine operations $240,871 both periods; and in 1945 includes fees earned under cost-plus-fixed-fee contract: 3 mos., $57,736; 6 mos., $ 115,156.

[2] After depreciation, depletion and amortization: 3 mos. 1946, $252,064; 1945, $269,821; 6 mos. 1946, $433,267; 1945, $512,996.

President Melvin H. Baker anticipates that shortages of labor, paper, steel and other materials which held back full production in the first half of 1946, have eased considerably, and that a much higher plant capacity would be maintained in the second half of the year. Plant additions will double the pre-war capacity by 1947.

•

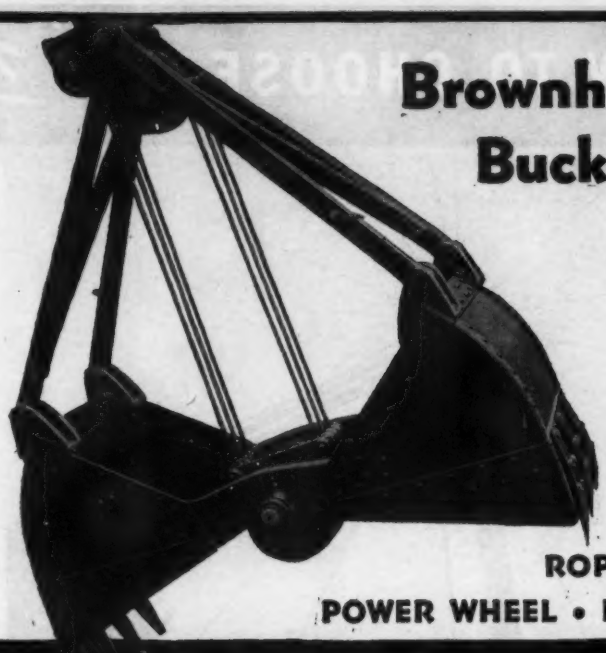
LONE STAR CEMENT CORPORATION, New York, N. Y., showed a net profit of $2,173,377 for the first half of 1946 as against $1,003,679 for the first half of 1945. Sales in the first half of 1946 were $18,725,897 as compared with $14,210,257 for a similar period in 1945.

•

LEHIGH PORTLAND CEMENT CO., Allentown, Penn., showed a net profit, after all charges, of $1,271,996 for the year ended March 31, 1946 as compared with $448,012 for a like period ended March 31, 1945.

•

KENTUCKY STONE CO., Louisville, Ky., had a net income of $82,686 for the year ended April 30, 1946 as compared with $68,737 for the year ended April 30, 1945. Net sales for the year ended April 30, 1946 were $1,332,338 as compared with $1,245,649 for a like period ended April 30, 1945.



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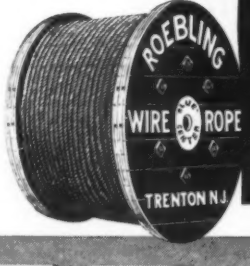

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INFORMATION

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TO HELP YOU MEET TODAY'S PROBLEMS AND TO MAKE PLANS FOR TOMORROW

1 BALL BEARINGS—New Departure, division of General Motors Corp., has released the third book in the series of technical treatises on ball bearings for designers and engineers. Part III covers enclosure and lubrication for all operating conditions. Parts I and II deal with bearing types and fundamentals of mounting practice, and describe details of shaft and housing designs.

2 BELTING — Hewitt Rubber Division of Hewitt-Robins, Inc., has released a new catalog describing and illustrating Monarch, Ajax and Conservo conveyor, transmission and elevator belting. Maintenance suggestions, sectional drawings showing belt construction, and applications are also shown.

3 BLOCK MACHINE—Gyro Mfg. Co. has released a 4-page folder describing and illustrating the Gyro concrete block machine, consisting of a vibrator table; stripper; five forming boxes; 200 steel pallets, and a roller conveyor system. Illustrations showing the complete installation, the stripper and the form box are also included.

4 BRAKE LININGS—United States Asbestos Division of Raybestos-Manhattan, Inc., has issued a 44-page catalog, entitled "Grey-Rock Industrial Catalog No. 646-I, describing and illustrating brake linings and clutch facings for mine hoists, unloaders, draglines, shovels, dredges, scrapers, concrete mixers, tractors, air compressors, cranes, etc. Lining and clutch facing recommendations and installation instructions, typical applications, etc., are also given.

5 BUCKETS — Koehring Co. new 8-page booklet No. J-233, describes and illustrates three types of all-welded clamshell buckets in sizes ranging from ⅜ to 2½ cu. yd. Complete specifications are also included.

6 BULLDOZERS — Caterpillar Tractor Co has published a broadside, Form 9356, describing and illustrating No. 8A and No. 7A angling type bulldozers for use with Diesel D8 and D7 tractors. Design, balance, visibility, ease and speed of angling and tilting are featured in the broadside.

7 BUYING GUIDE — Allis-Chalmers Mfg. Co. has issued a new bulletin, No. 25-B-6177-B, "Buying Guide of Allis-Chalmers Equipment for the Process Industries," giving suggestions in selection of motors, motor controls, power generation and distribution equipment, grinding and roller mills, pyro-processing machinery, blowers and compressors, V-belt drives, electronic heating and welding equipment.

8 CONCRETE ADMIX — Sika Chemical Corp. has issued an 8-page folder entitled "Plastiment — The Concrete Densifier" describing and illustrating the advantages of Plastiment as an admix to produce a denser concrete. General and suggested specifications for Plastiment are also given.

9 CONCRETE ADMIX—L. Sonneborn Sons, Inc., has issued a new "Timely Topics" bulletin No. 7, describing and illustrating the advantages of Hydrocide as an admix to produce a denser concrete; also the use of Trimix as a water repellent, and Sonobrite as a coloring.

10 CONCRETE BREAKER — Universal Pneumatic Tool Co., Inc., has issued a bulletin on the Maloney concrete and rock buster which can be used with either air hammer or sledge after inserted in drilled hole. The drill steel guide and drill steel ejector are also described.

11 CONTROLLERS—Bailey Meter Co. has issued Bulletin No. 17, describing and illustrating process controllers, control components, measuring components and instrument combinations. Application data such as sizes, pressure standards and ranges are listed for the various components.

12 CRANES — Orton Crane & Shovel Co. has published a 16-page catalog No. 73, describing and illustrating one-man aero cranes. Dimensions of all seven models, capacities, and weights of rehandling and excavating clamshell buckets loaded with sand, gravel, crushed stone, earth, etc., are also shown.

13 CRUSHERS—Straub Mfg. Co. Bulletin No. 603 describes and illustrates Kue-Ken Simplex crushers for mines and quarries. Construction details and a sectional view of the crusher, together with information on feed opening, speed, weights, etc., of Nos. 70, 90 and 110 Simplex crushers, are also shown.

14 CRUSHERS — Universal Engineering Corp. Bulletin No. 56 describes and illustrates the 546-P primary crushing unit consisting of shovel loading feed hopper, apron feeder, bar grizzly and by-pass, jaw crusher, underconveyor and power unit. Detailed information, specifications, diagrams showing flow of material, etc., are also shown.

15 DIESEL ELECTRIC SETS — Caterpillar Tractor Co. has released a new booklet, Form 9321, describing and illustrating various types of Diesel electric sets. Specifications, construction details and typical applications are included.

16 DIESELS—The Buda Co., has released a 12-page catalog, Bulletin No. 1190, describing and illustrating a new line of "One-Sixty-One" series Diesel engines for automotive, industrial and marine service, ranging from 15 to 300 horsepower. Illustrations show 1- to 8-cylinder models. Pressure lubrication data and engine data table are also given.

17 DIESELS—Caterpillar Tractor Co. has released a new 8-page booklet, Form 9364, describing and illustrating the chores that can be accomplished by Diesel engines in quarry work, including stripping and excavating, cleaning stockpile floor and general quarry area, stockpile loading by track-type tractors, hauling by wheel-type tractors, and powering of portable crushers, conveyors, generators, air drills, shovels and locomotives.

18 ELECTRODES—R. G. LeTourneau, Inc., has released a new Tournaweld wall chart for quick reference in choosing electrodes to meet special problems. Five types of electrodes are described. Listed with each type are its built-in characteristics and purpose, available sizes, distinguishing color, and proper current for efficient operation. Sketches illustrate typical applications.

19 FEEDERS—Allis-Chalmers Mfg. Co. will soon release a limited number of copies of Annual Engineering Review describing and illustrating new developments in 1945 equipment for crushing, screening, grinding, washing and other processing phases in the rock products, cement and mining industries. Reviewed in the book are the new heavy duty apron feeders for use with large jaw and gyratory crushers, Ripl-Flo vibrating screens, preliminator ball mills, rotary kilns, log washers, low-head transformers and rectifiers, the new crushing and grinding pilot plant for mineral testing, etc.

20 FLAME HARDENING APPARATUS—Air Reduction Sales Co. has issued Catalog No. 90 describing and illustrating the use of Airco portable flame hardening apparatus, which can treat large parts without removal from the assembly. Manifolds, regulators, valves, seals, flame hardening torches, flat surface hardening tips, gear hardening apparatus and tips, etc., are also described.

21 HOISTS—Stearns Mfg. Co. has published a 2-page folder describing and illustrating the Stearns-Warren yardhoist, available with or without gasoline-driven compressor, for handling concrete block. The folder also gives general specifications.

22 HOISTS—Vulcan Iron Works has issued a new 32-page bulletin, No. A-407, describing and illustrating self-contained electric hoists. Construction details, safety devices, dimensions, specifications, tables of sizes, plan and elevation details of all models are also included in the bulletin.

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23 INDUCTION MOTORS—The Louis Allis Co. has released a new bulletin, No. 720, describing and illustrating Type OG standard squirrel cage induction motor. Construction details, special features and typical applications are also shown.

24 INSULATORS—B. F. Goodrich Co. has published Bulletin G-7320-GI describing and illustrating three new vibro-insulators, types 130, 133 and 144. The booklet also shows many other types of insulators, characteristics of each type and proper selection for specific requirements.

25 LIFT TRUCKS — Hyster Co. has released Form 1016 describing and illustrating a lift truck on pneumatic tires, the Hyster 40, which has a capacity range up to 4000 lb., is easy to operate and simple to service. Form No. 1001 describes and illustrates the Hyster 20, 75, 150, M, and MH lift trucks and the Karry Krane. Typical applications are also shown.

26 LUBRICATION—R. G. LeTourneau, Inc., has prepared a new wall chart, Form No. G-1067, as a guide for service and maintenance men in lubricating equipment. Photographs show lubrication points, and the chart tells what kind of lubricant to use and how often.

27 LIFT TRUCK SURVEYS — Towmotor Corp. has issued illustrated lift truck job studies as an aid to manufacturers with materials handling problems. These studies report in detail the methods used by leading manufacturers to speed up the materials handling system.

28 LIFT TRUCKS—Trackson Co. has published a new bulletin, Form No. 895, describing and illustrating the new Model IT4 Traxcavator. The bulletin also gives the advantages and specifications of the unit.

29 MAINTENANCE—Turco Products, Inc., has released Bulletins AS-362, AS-363 and AS-364, in both Spanish and English, giving hints on the maintenance and care of plants, motors and aircraft. Bulletin AS-362 gives valuable information concerning rust removal, water-scale elimination, steam cleaning, paint stripping, etc. Bulletin AS-363 deals with all phases of motor and chassis cleaning. Bulletin AS-364 covers the entire field of aircraft cleaning.

30 MIXERS—Chain Belt Co. has issued Bulletin No. 481 describing and illustrating the new Rex 11S and 16S concrete mixers. Mechanical details and complete specifications on all parts of the mixers are also included.

31 MOTOR CONTROL EQUIPMENT—Allis-Chalmers Mfg. Co. 16-page handbook, B-6452, describes and illustrates motor controls equipment, including data covering the type, maximum horsepower, volts and description of motor controls. Also described are multiple V-belt drives, transformers, switchboards, switchgear and circuit breakers, as well as equipment for power generation and centrifugal pumps, and water conditioning chemicals and equipment.

32 PROTECTIVE COATINGS—Prufcoat Laboratories, Inc., has released a 12-page folder describing and illustrating Prufcoat, a protective coating for concrete floors, interior and exterior masonry walls, tanks, structural steel, pipes, machinery and equipment, against acids, alkalies, water and oils. Price list, color chart and standard specifications are given on additional supplements.

33 PYROMETERS—The Brown Instrument Co. has released a Buyers' Guide on standard pyrometer supplies, No. 100-1, describing and illustrating various types of standard thermocouples. Prices and instructions on how to select and order proper thermocouples, protecting tubes, wire, leadwire, insulators, etc., are also included in the guide book.

34 RECORDERS—The Bristol Co. new 12-page bulletin, No. S1400, which replaces Bulletin 542, describes and illustrates tachometers for recording and indicating speed of rotation and speed of travel. Also shown are the Pyromaster potentiometer-type tachometer and the millivoltmeter-type indicating and strip-chart recording tachometers. Complete wiring diagrams, application data and accessory information are also given.

35 SCREENS—Pioneer Engineering Works has released a new 16-page bulletin on vibrating screens. The bulletin fully illustrates and describes a complete line of vibrating screens suitable for pits, mines and quarries. Details of construction, specifications on types and sizes are also included.

36 SCRUBBERS — Hardinge Co., Inc., has released Bulletin No. 37-A, describing and illustrating conical scrubbers for gravel, stone, phosphate rock, gold ore, etc. Principles of operation, capacity, specifications of seven models of scrubbers, and typical applications are also shown.

37 SHOVELS—Bucyrus-Erie Co. has published an interesting booklet entitled "In War and Peace Progress Starts with Excavation" describing and illustrating various types of shovels and draglines, dredges, railway cranes, blast hole, oil well and water well drills in use during the war and on various peacetime projects.

38 SHOVELS — Lima Locomotive Works, Inc., has issued a new 20-page bulletin, No. 82A, describing and illustrating type 802 shovel, crane and dragline. Specifications, capacities, working ranges and construction details are also given.

39 SHOVELS — Lima Locomotive Works, Inc., has released a new bulletin, No. 121-B, describing and illustrating Type 1201 shovel, crane and dragline with air control.

40 STEEL—Jones & Laughlin Steel Corp. has published a 16-page booklet, Form No. AD-143, describing and illustrating Otiscoloy, a high tensile, low-alloy steel. Technical information, suggested applications and other useful information on Otiscoloy is included in the bulletin.

41 TRACTORS — Allis-Chalmers Mfg. Co. has issued a 24-page catalog form No. MS-290A, describing and illustrating the new HD-7 Diesel tractor. Facts and figures about the tractor's five speed ranges, engine dimensions, fuel capacities, shipping weights, track design, etc., are also given.

42 TRACTORS—Hyster Co. bulletin, Form 1011, describes and illustrates a combination dragline, clamshell, and crane with track-type tractor and bulldozer, known as the Hystaway, which is easily installed and removed. Winches, double drums, cranes, and typical applications of this equipment are also shown.

43 TRUCKS—M-R-S Mfg. Co. has published a new catalog describing and illustrating the bottom-dump hauling unit, the Mississippi Wagon. Various models are described and complete specifications for each are given.

44 TRUCK LEASING — National Truck Leasing System has published the first issue of "Truck Leasing News" giving information and typical examples of various industries utilizing N.T.L.S. in solving transportation-by-truck problems. A descriptive brochure listing the advantages of a truck leasing arrangement has also been issued.

45 WATERPROOFING — Truscon Laboratories, Inc., has released Book "A", describing and illustrating products for waterproofing iron and dampproofing bituminous products. It also covers information on coatings for swimming pools, paint for damp walls, shrink proof mortar, and transparent membrane method for curing concrete.

46 WIRE ROPE—Union Wire Rope Corp. has compiled a series of nine educational bulletins as a reference index for users of wire rope. Bulletin No. 1, entitled "Rope Dope," covering replacement of wire rope as to size, tread, diameter and type of construction, is now available. Future bulletins will cover subjects such as lays of wire rope, types, installation, etc.

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(10-48)

ROCK PRODUCTS, 309 W. Jackson Blvd., Chicago, Ill.

I would like to have the items circled.

1	2	3	4	5	6	7	8	9	10
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Name ..... (Position) .....

Company .....

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Here's the plant...

... that fits all aggregate production requirements —

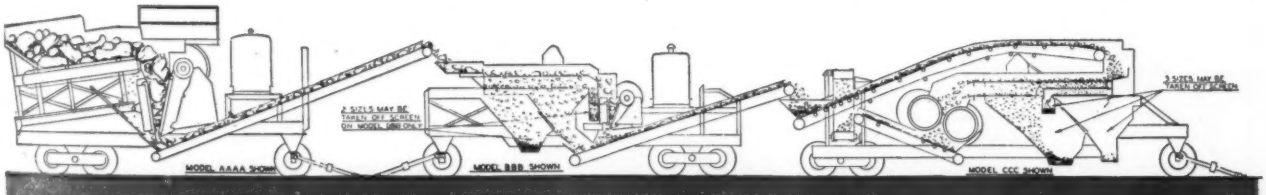
... any quantity ... any specification

IT'S A Cedarapids Unitized Plant that will crush, size and wash rock or gravel to fit any specification from riprap stone to agstone. The complete set-up consists of a primary crusher unit, a secondary crusher unit, a roll crusher unit and a washing and sizing unit. Each unit is complete in itself and can be used alone or in any one of a dozen different combinations depending upon the pit or quarry and the finished product desired. A wide range of sizes of each unit makes it possible to have a plant with almost any desired capacity. Choice of roll crusher, cone crusher, twin jaw crusher or hammermill provides still more flexibility.

You can start with the secondary jaw and roll units to produce crushed gravel and add the other units as your demands increase. Get the complete story from your nearest Cedarapids distributor and study the flow diagram below.

When buying a crushing plant — buy the best — buy Cedarapids.

Iowa Manufacturing Company, Cedar Rapids, Iowa, U. S. A.


MODEL AAAA SHOWN
2 SIZES MAY BE TAKEN OFF SCREEN ON MODEL BBB SHOWN
MODEL BBB SHOWN
MODEL CCC SHOWN
3 SIZES MAY BE TAKEN OFF SCREEN

Cedarapids

Built by IOWA

THE IOWA LINE *of Material Handling Equipment Includes:*

ROCK AND GRAVEL CRUSHERS
BELT CONVEYORS—STEEL BINS
BUCKET ELEVATORS
VIBRATOR AND REVOLVING SCREENS

STRAIGHT LINE ROCK AND GRAVEL PLANTS
FEEDERS—TRAPS
PORTABLE POWER CONVEYORS
KUBIT IMPACT BREAKERS

TRAVELING (ROAD MIX) PLANTS
DRAG SCRAPER TANKS
WASHING PLANTS
TRACTOR-CRUSHER PLANTS
STEEL TRUCKS AND TRAILERS

PORTABLE STONE PLANTS
PORTABLE GRAVEL PLANTS
REDUCTION CRUSHERS
BATCH TYPE ASPHALT PLANTS

Picture shows a 750-ft. span Sauerman Slackline Cableway equipped with a 2 cu. yd. bucket cutting into a deep deposit of gravel and moving the gravel to a screening plant at rate of 150 tons an hour.

SAUERMAN SCRAPERS and CABLEWAYS

Continuous Automatic Material Handling With Simple One-Man Control

Sauerman Cableways and Scrapers are reducing material handling costs and solving labor problems on large and small pit and bank excavation, stripping and stockpiling jobs all over the world—digging any material a plough can penetrate, ranging rapidly over large areas, hauling and dumping all in one operation. Excavate equally well under water, on swampy ground, on hillsides, or in pits. Speedy, powerful machines that cost little to install and little to operate.

Send for our catalog and see convincing evidence of the extra yardage produced by Sauerman Equipment.

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SAUERMAN
Long Range Material Handling Machines

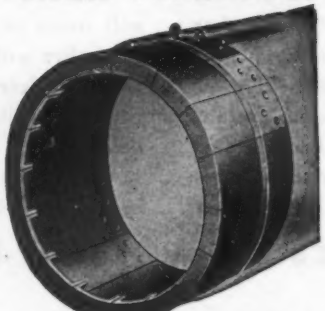
KILN END
Burn-Outs
KILL PROFITS

PYRASTEEL
KILN ENDS

. . . prevent costly burn-outs and shutdowns that result in serious loss of production.

Install PYRASTEEL Segmental Kiln Ends at *both* the discharge and feed ends of your cement kilns, and be assured of long, dependable, and economical service.

Write for Bulletin of This Heat-Resisting Alloy



Showing discharge end of cement kiln fitted with PYRASTEEL Segmental Kiln Ends.

Unit segments are easy to install or replace

CHICAGO STEEL FOUNDRY COMPANY
PYRASTEEL for high temperatures
KEDZIE AVE & 37TH ST
CHICAGO 32, ILL.
Makers of Alloy Steel for 30 Years
EVANSTEEL for strength

Manufacturers' News

Gar Wood Industries, Inc., New York, N. Y., has named Clifford A. Sharpe as works manager in charge of manufacturing activities in Detroit, Wayne and Marrysville, Mich.; Newport News, Va.; Findlay, Ohio; Mattoon, Ill.; and St. Paul, Minn. Mr. Sharpe was recently assistant to the general manager of Hughes Aircraft Co. Prior to that, he was works manager of the Ft. Worth plant of Consolidated-Vultee and assistant to the vice-president in charge of manufacturing.

Davey Compressor Co., Kent, Ohio, has appointed Brown & Hubert, Inc., Evansville, Ind., as distributor of Davey compressors. Ralph C. Hubert is president; Herman S. Brown, vice-president and treasurer, and Mrs. R. C. Hubert, secretary.

Nordberg Mfg. Co., Milwaukee, Wis., announces the consolidation of the Los Angeles and San Francisco offices in a new building and warehouse at 674 Harrison St., San Francisco. No change has been made in the personnel of the two offices. C. G. Cox, Pacific Coast manager; George Lienhard, installation and service engineer of the heavy machinery division; and T. D. Davis, district manager for the crusher and process machinery divisions will make their headquarters at the new location.

The Dorr Co., New York, N. Y., announces that Dr. John V. N. Dorr and his grandson Burr Hardon, recently discharged from the Marines, have returned from a five weeks' tour of Europe, which included a visit to Germany on a special mission for F.I.A.T. (Field Intelligence Agency Technical). They were accompanied by Dr. Anthony J. Fischer who recently completed a special investigation for F.I.A.T. on sewage treatment development in Germany.

Mack Trucks, Inc., New York, N. Y., has announced the appointment of Dwight R. Collin as personnel director, and John W. Adelung as district manager of the White Plains, N. Y., office.

Wickwire Spencer Steel Division of the Colorado Fuel & Iron Corp., New York, N. Y., has moved its general sales manager's office from 500 Fifth Ave., New York, N. Y., to 361 Delaware Ave., Buffalo, N. Y. A. G. Bussmann, vice-president in charge of sales, and H. C. Allington, assistant general sales manager, will also move to the new address, as will the wire department general office under C. G. Matthews, and the advertising department under S. E. McCrum. The wire rope department under A. S. Rairden has been moved to the plant at Palmer, Mass. The New York City sales office will be known as the Eastern district sales office, with Percy Jenkins as district sales manager.

Gar Wood Industries, Inc., New York, N. Y., has announced the appointment of Robert L. Bartley as sales manager of the tank division.

International Harvester Co., Chicago, Ill., announces that E. A. Razek, formerly retail motor truck manager at the Richmond branch, has been transferred to the Atlanta branch as assistant manager. B. G. Jones, formerly credit manager at Louisville, has been appointed assistant manager, Louisville motor truck branch.

Marmon-Herrington Co., Inc., Indianapolis, Ind., has elected Russell L. White a member of the board of directors. Mr. White is also a director and treasurer of the Indiana Limestone Co. of Bedford, Ind.

C.I.T. Corp., New York, N. Y., announces the opening of a regional office in Atlanta, Ga., under the management of Edward H. Mayer, assistant vice-president.

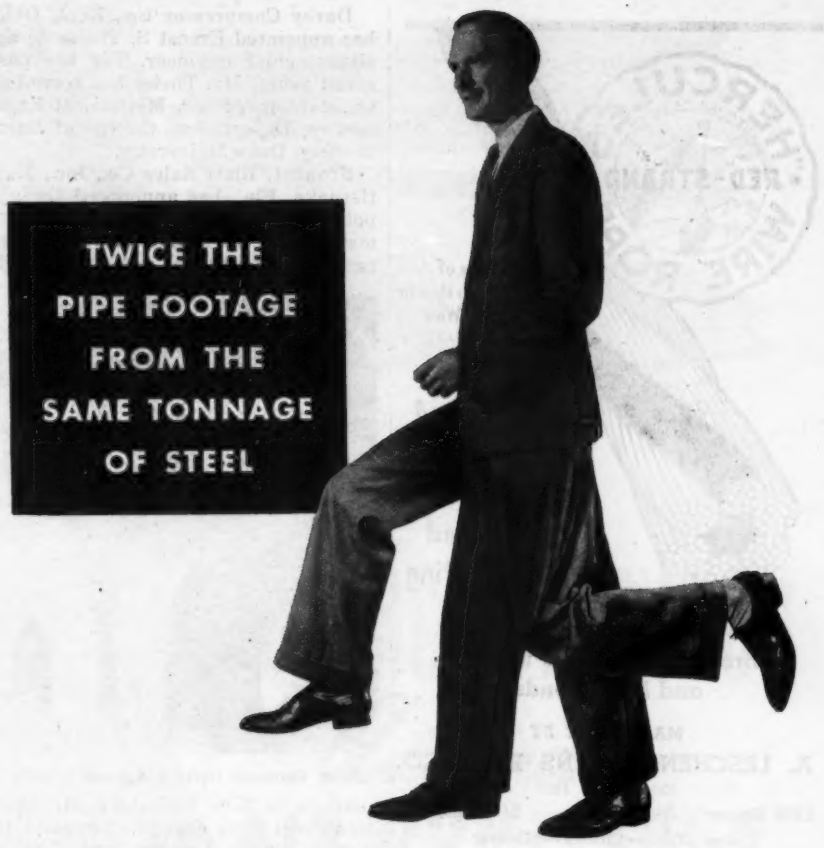
Lovejoy Flexible Coupling Co., Chicago, Ill., announces that Walter B. Briggs has been appointed general manager of the power transmission division. He was formerly manager of the power transmission division of Ideal Industries, Inc. The Lovejoy Flexible Coupling Co. has long been known throughout the industry for its resilient alignment couplings for every duty and type of service from 1/6 to 2500 hp., ranging from small pumps to the heaviest duties of rock products operations, chemical plants, etc. Speed control equipment includes V-belt pulleys for fractional horsepower drives; wide V-belt pulleys, and "Select-O-Speed" transmissions for wide driven speed ranges; sheaves; and adjustable motor bases.

Walter B. Briggs

Hyster Co., Portland, Ore., and Peoria and Danville, Ill., has appointed Clarence H. Collier, Jr., as manager of the industrial lift truck eastern division, with headquarters in Peoria, Ill.

R. G. LeTourneau, Inc., Peoria, Ill., has announced the appointment of Wendell Richards as market research manager. He was formerly district sales representative in Pittsburgh, Philadelphia and Baltimore. Cloyd Richards, assistant service manager, has been named general service manager to succeed C. F. Zimmerman, who recently transferred to the sales field.

O. A. Williams has been appointed Eastern sales manager to succeed Harry Conn, who has resigned. C. F. Zimmermann, general service manager, will replace Mr. Williams as district sales representative in Ohio, Indiana and Michigan. Harold R. McQuarrie, Eastern credit manager, has been made assistant to the domestic sales manager.



***No wonder more and more mining engineers are switching to* NAYLOR *light-weight* PIPE**

Twice the pipe footage from the same tonnage of steel. Laying costs reduced as much as 50 per cent. Coupling methods that revolutionize pipe installation in speed and economy. Reduced trucking expense. High salvage value.

These are a few of the advantages Naylor light-weight pipe offers you. Its versatility of use on high or low pressure jobs makes it ideal for the many applications in the mining field.

Get the complete story on Naylor's exclusive pipe structure and how you can take advantage of its greater performance in your work. Write for a registered copy of the new Naylor Catalog today.

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Made of Acid Open Hearth Steel Wire

Round Strand
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The Service Record of this wire rope continues to make and hold friends.

MADE ONLY BY

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New York — Chicago — Denver
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For Uniform, Controlled Concrete

Install [SC]2 PRECISION CONCRETE CONTROL It Includes

Moisture Meter

Makes a test for moisture content of fine or coarse aggregates in ONE minute. Accurate to ¼%.

Compensator

Delivers correct DRY weight of wet aggregates and ADDED water. Makes a graph record of EVERY BATCH.

[SC]2 CONTROL produces uniform concrete. Is always approved by concrete engineers. Has definite sales value. Write for our booklet "Profits in Concrete."

SCIENTIFIC CONCRETE SERVICE CORP.

724 Salem Avenue, Elizabeth 3, N. J.

Davey Compressor Co., Kent, Ohio, has appointed Ernest S. Theiss as assistant chief engineer. For the past seven years, Mr. Theiss has served as assistant professor, Mechanical Engineering Department, College of Engineering, Duke University.

Frank I. Blatt Sales Co., Inc., Rattlesnake, Fla., has announced the appointment of H. R. Cardenas as export manager of the company's newly organized export division, with headquarters in New York City. Mr. Cardenas will have charge of exports to Europe, South America and Central America. A. "Kinney" Kincaide has been named sales manager and will represent the company throughout the United States. He will make his headquarters at Rattlesnake, Fla. The Blatt block plant equipment is manufactured for the Frank I. Blatt Sales Co., Inc., by the Hendry Corp.

H. R. Cardenas (left) and Frank I. Blatt

Joseph T. Ryerson & Sons, Inc., Chicago, Ill., announces that T. L. Kishbaugh has joined the staff of the company's new steel plant now under construction in Los Angeles, Calif. Mr. Kishbaugh was vice-president and merchandising manager of Earle M. Jorgensen Co., Los Angeles, for two years prior to his resignation early in 1946.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has named Richard F. Muller as manager of the New Orleans district office, succeeding F. W. Stevens who has retired after 41 years of service.

The Dow Chemical Co., Midland, Mich., announces that Howard P. Atkin and Ray H. McLeod have joined the cathodic protection sales staff, Mr. Atkin in Los Angeles and Mr. McLeod in Chicago. John W. Mighton is on the magnesium sales staff.

Chain Belt Co., Milwaukee, Wis., has purchased the heavy ordnance plant constructed for the Defense Plant Corp. in West Milwaukee, for the manufacture of chain belts and some construction machinery.

H. K. Porter Co., Inc., Pittsburgh, Penn., has announced the acquisition of the Brake Equipment & Supply Co., Chicago, Ill.

TIME SAVERS AND MONEY MAKERS

Plants processing rock products are finding Neff & Fry superconcrete interlocking stave bins a real investment — great capacity—fast disbursing to truck or car—time and labor saving.

Any diameter or height. Can be dismantled and moved. Covered by guarantee.

1946 Catalog Ready

THE NEFF & FRY CO.
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BINS BY NEFF & FRY

Join the Industry's 12,000 Subscribers to ROCK PRODUCTS

Every issue of ROCK PRODUCTS brings you news of your industry, suggested solutions to your problems, marketing ideas and scores of other valuable features.

$3 two years, $2 one year

ROCK PRODUCTS
309 W. JACKSON BLVD.,
CHICAGO 6, ILL.

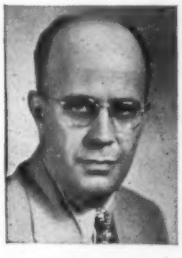
Diamond Iron Works, Inc., Minneapolis, Minn., has announced the appointment of F. H. Jusenius as general sales manager of the rock and gravel crushing machinery line and the stoker division. P. A. Giessel and C. L. Vader have been made assistant sales managers.

Mr. Jusenius was formerly in charge of export sales for the company, and previously was with R. G. LeTourneau, Inc., Peoria, Ill., and Bucyrus-Erie Co., South Milwaukee, Wis. He is a graduate civil engineer.

Mr. Giessel, a mechanical engineer graduate of the University of Minnesota, returned to the company several months ago after three years of service in the Armed Forces as a Major. He is well known in the crushing equipment industry with extensive experience in quarry and gravel plant design, sales and service.

F. H. Jusenius

Mr. Vader has been associated with the company since 1942 and prior to that time was active in construction work for many years in Minnesota and the Northwest. He was also associated with Rosholt Equipment Co. as sales engineer.



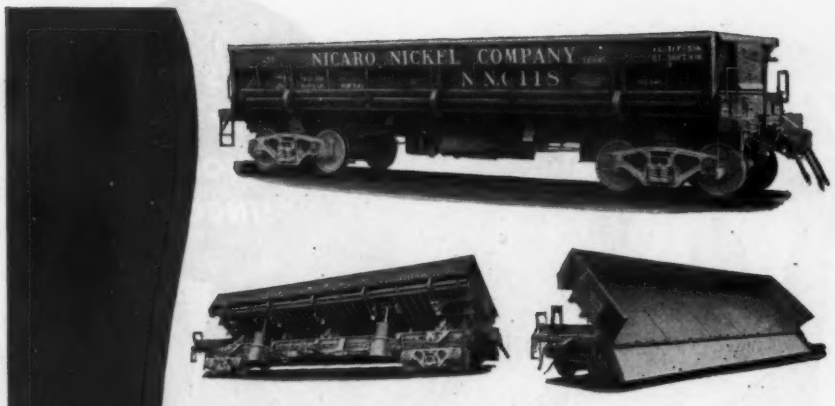
C. L. Vader

P. A. Giessel

Timken Roller Bearing Co., Canton, Ohio, has appointed R. E. Wagenhals as director of quality control for all bearing divisions of the company. He was formerly quality control engineer. Sherman R. Lyle has been appointed district sales engineer at Canton Ohio; William Earle Bryden at Akron, and Alfred J. Kinnucan at Philadelphia, Penn.

Raybestos-Manhattan, Inc., Passaic, N. J., has been awarded a certificate of honorable mention by the Financial World in recognition of the progress reflected in its 1945 Annual Report to Stockholders.

Robins Conveyors, Inc., Passaic, N. J., announces that Harold Von Thaden, first vice-president, has sailed aboard the American-South African Liner, African Star, for Johannesburg, South Africa, where he will spend several months analyzing and studying market conditions and distribution methods for the company's products. Frank Hampton is resident manager in Johannesburg.



Steelcar

ROLLING TRUNNION

Automatic

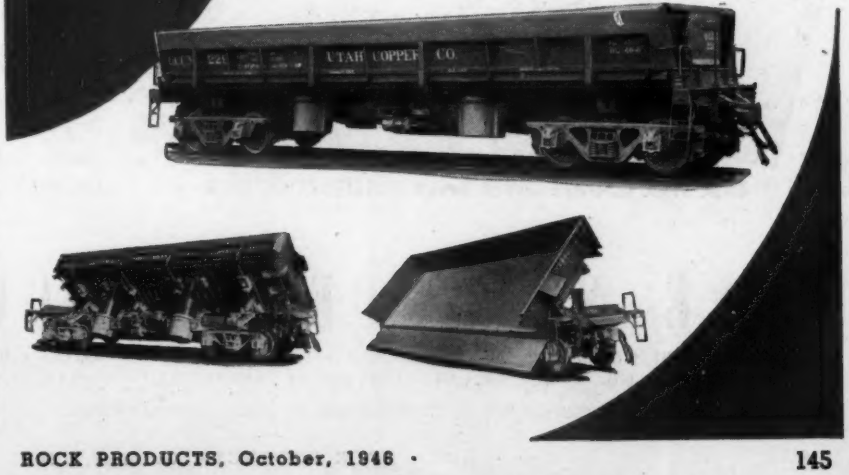
AIR DUMP CARS

Adequate power to dump quickly and completely—maximum economy of compressed air—high tensile low alloy steels—All-steel construction—greater pay loads—All these and many other exclusive features make STEELCAR equipment more dependable, more economical. *Write for Catalog 72-C.*

PRESSED STEEL CAR COMPANY, INC.

PITTSBURGH 19, PA.

NEW YORK....CHICAGO....ST. LOUIS....ST. PAUL



Heavy Duty Concrete

—QUICKER, SURER... WITH 'INCOR'!

MANY Ready Mix Plant customers ask for 'Incor' 24-Hour Cement for heavy-duty concrete . . . floors, loading platforms, wherever durability, wear resistance and watertightness are essential. That's because—in addition to a good concrete, properly placed—THOROUGH CURING is positively necessary. But thorough curing means keeping ordinary concrete wet 6 to 8 days—next to impossible under job conditions. And that's why the builder asks for 'Incor' —because 'Incor' cures THOROUGHLY in 24 to 48 hours, saving 5 to 7 days. This also means that floors can be resurfaced economically over a week-end, avoiding plant tie-up. Heavy-duty concrete—quicker, surer—*another good reason why* leading Ready Mix Operators make 'Incor', America's FIRST high early strength Portland cement, available at all times, as part of their good service.

LONE STAR CEMENTS COVER EVERY CONSTRUCTION NEED

Heavy-duty floor built with 'Incor' at Dr. Pepper Bottling Works, Springfield, Mo., shown in photos, above. Contractor, H. H. Stephens; Ready Mix 'Incor' Concrete from Garrett Const. Co., both of Springfield, Mo.* *Reg. U. S. Pat. Off.

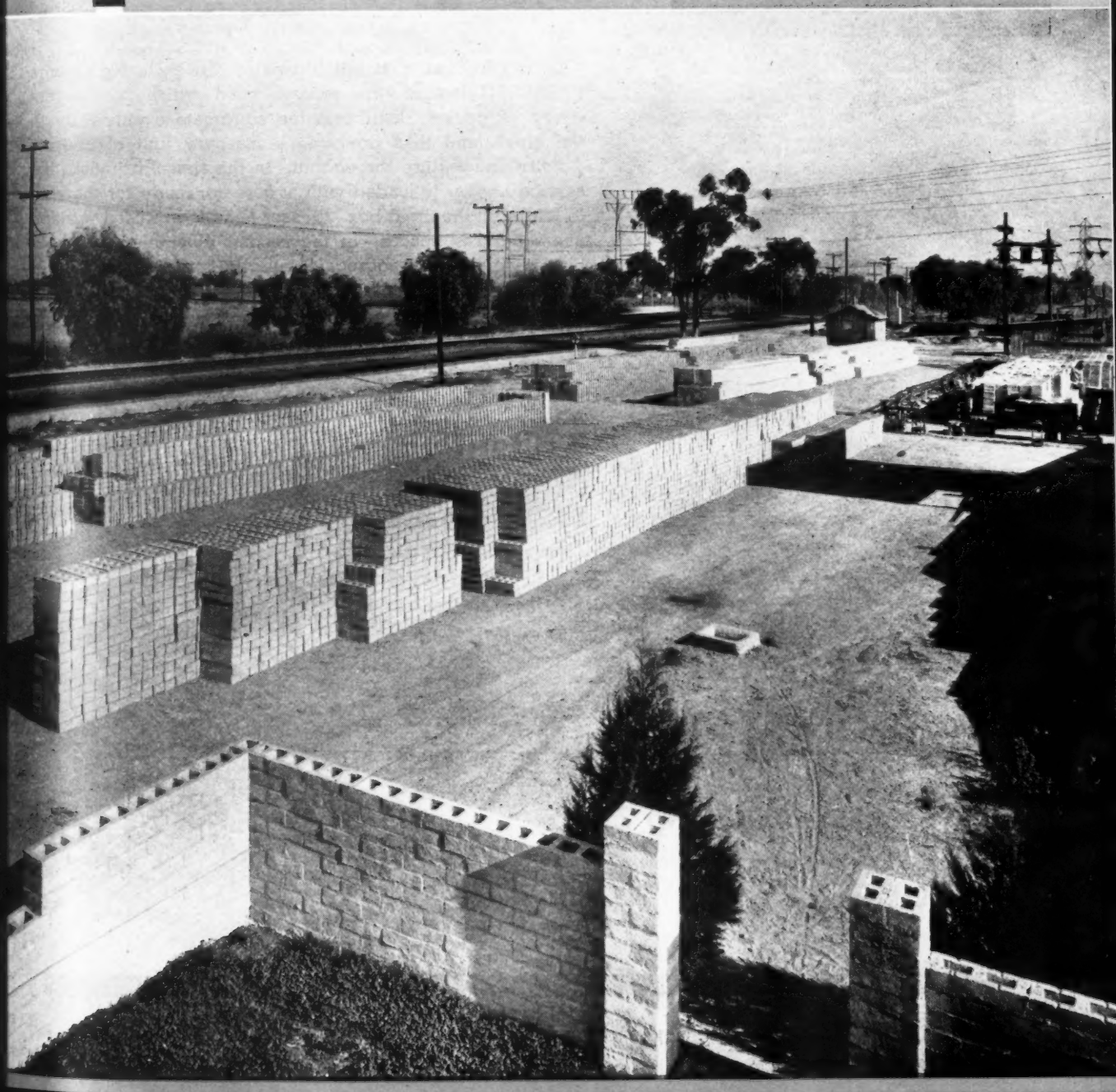
LONE STAR CEMENT CORPORATION

Offices: ALBANY • BETHLEHEM, PA. • BIRMINGHAM • BOSTON • CHICAGO • DALLAS • HOUSTON • INDIANAPOLIS • JACKSON, MISS. KANSAS CITY, MO. • NEW ORLEANS • NEW YORK • NORFOLK • PHILADELPHIA • ST. LOUIS • WASHINGTON, D. C.

LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 15 MODERN MILLS, 25,300,000 BARRELS ANNUAL CAPACITY

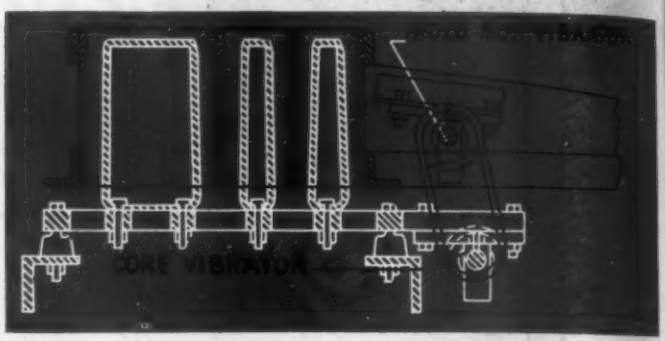
ROCK PRODUCTS
CONCRETE PRODUCTS
and Cement Products

Typical outside storage of concrete units in California

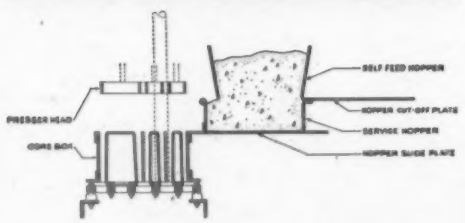


Why THE GEORGE SUPER V CONCRETE BLOCK MACHINE PRODUCES *Sturdier* MASONRY UNITS *Faster*

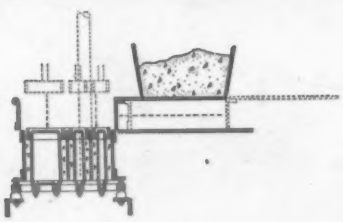
* Cutaway drawing at right illustrates the SUPER VIBRATION principle of the George machine. A coordinated dual mechanism shakes both the mold box and the mold cores simultaneously, settling the aggregate quickly and firmly. Violent up and down motion of both the mold box and cores, activated by the vibrators, works as a trowelling action on both the inner and outer surfaces of the block, forming a smooth, unusually water-repellent surface. SUPER DUAL VIBRATION turns out MORE blocks per hour.



IN RAISED POSITION



IN OPERATION



* Cutaway drawing at left illustrates the exclusive George PRESSPAC feature—the presser head which presses out every air pocket, distributes the aggregate evenly through the block, and thus produces a masonry unit of uniform density and texture throughout. In the first illustration, the service hopper is loaded with aggregate, ready for the shift to left to fill the mold box. Presser head is in raised position over core box spaces. In the second illustration the mold box is filled with aggregate and the presser head is in lowered position, forcing the mixture evenly through the block.

GEORGE SUPER V
TRADE MARK

F. C. GEORGE MACHINE CO.

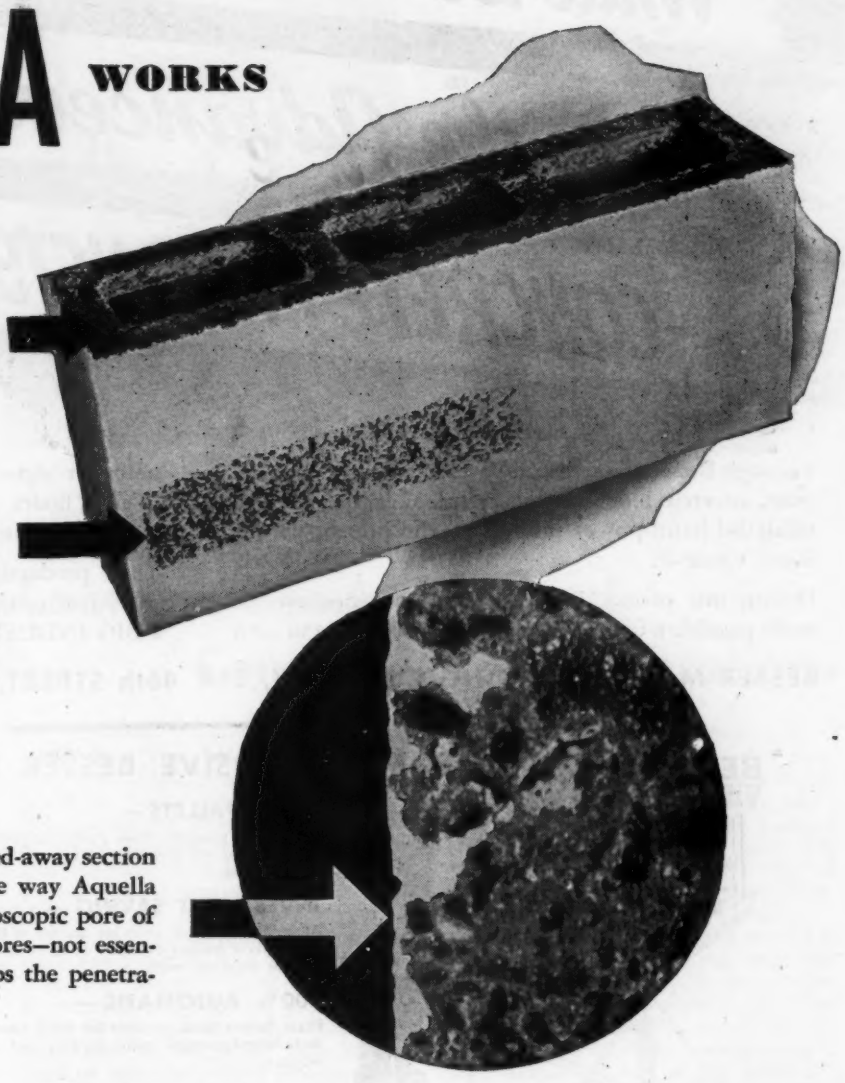
100 S. WESTMORELAND DR.

ORLANDO FLORIDA

*Patent Pending

THE PRINCIPLE ON WHICH

AQUELLA WORKS



1 Here is an Aquellized concrete masonry unit filled with water. Naturally, there is no leakage.

2 But what happens if the Aquella surface coating is scraped off? To answer that, we scraped away this portion, and there's still no leakage. This may be slightly puzzling until you study the photograph of the third step...

3 The enlargement of a small, sawed-away section of the above block, which shows the way Aquella penetrates to fill and close each microscopic pore of the surface. It is the filling of the pores—not essentially the surface coating—which stops the penetration of water.

YOU SEE IT NOW—the principle on which Aquella works to make concrete masonry structures watertight!

The properly balanced ingredients of which Aquella is composed are so *finely ground* that when mixed with water, and scrubbed into the masonry, they penetrate and fill even the minutest pores of the surface.

Then—contrary to the shrinkage phenomena of most waterproofing materials—Aquella continues to *expand* as it cures to set up a hard, firm bond which stops water leakage, dampness or seepage.

Consequently, even the presence of a hydrostatic head of water on the *unprotected side* has no effect whatsoever on the integrity of the Aquellized surface. Nor does it in any way affect Aquella's inherent property to resist capillary action or water seepage. Aquella is cheerfully bright in its natural white finish...does not powder, peel or flake, and can be painted over with any color.

SPECIFY AQUELLA FOR CONCRETE, BRICK, LIGHT WEIGHT MASONRY UNITS, STUCCO OR CEMENT PLASTER.

Free from the organic binders, hygroscopic salts and stearates used in the making of ordinary water barriers, Aquella is an entirely new mineral surface coating which you can specify for watertightness inside or outside...above or below ground on all porous masonry surfaces.

FREE

Write today for your copies of *"Aquella and Concrete Masonry Construction"* and the *"Key to Aquella Specification Types."*

SEE OUR CATALOG IN SWEET'S

PRIMA PRODUCTS, INC.

DEPT. (A 5), 10 EAST 40TH STREET NEW YORK 16, N. Y.

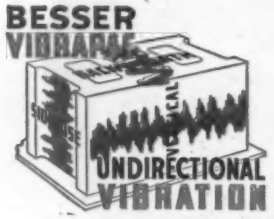
What BESSER has Contributed to the Advancement of the CONCRETE PRODUCTS INDUSTRY!

Through Besser research and development in the past 42 years, concrete block machinery has advanced from the small all-hand-power models to the present unitized Super Vibrapac.

During this period, Besser machine advancement has made possible a unit production increase from 150 — 8" units per eight hour day to 4800 superior quality units in eight hours. Hand labor has been reduced to pushing a switch button and guiding a power offbearing hoist.

These production facilities have converted concrete masonry production from a small "backyard" occupation to a BIG INDUSTRY.

BESSER MANUFACTURING COMPANY, 210 46th STREET, ALPENA, MICHIGAN, U.S.A.



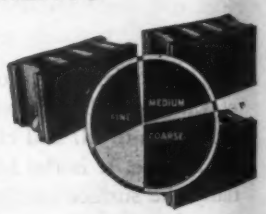
BESSER SUPER VIBRAPAC —

Makes all sizes of block on the same set of plain pallets. Block 8" x 8" x 16" are made three at a time. Smaller block made in equivalent multiples. Vibrapac fully automatic including pallet feeding. One man offbears full machine production with power hoist.

SOME EXCLUSIVE BESSER DEVELOPMENTS

PLAIN PALLETS —

The Besser patented Plain Pallet Stripper block machine proved to be the greatest advancement in concrete block manufacture.



INVESTMENT SAVING —

Making all sizes of units on one set of Plain Pallets has saved plant owners as much or more in pallet cost than cost of machine itself.

100% AUTOMATIC —

Plain Pallets made possible the 100% automatic machine, including automatic pallet feeding and easy power offbearing.

OPERATING ECONOMIES —

Besser automatic mechanical advancements naturally reduced labor costs and increased production with resulting economy.

UNDIRECTIONAL VIBRATION —

Mold is cushioned on shock-absorbing rubber mounts, free to vibrate in any direction. This same cushioning principle is used in engine mounting.

FULLY PRESSED TOP —

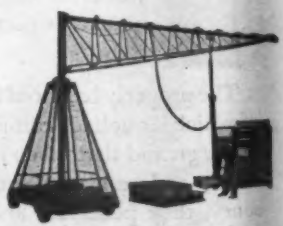
Units have smooth, even top, straight, sharp edges and accurate dimensions. Specified by leading architects and builders.

SELECTIVE TEXTURE AND DENSITY —

Units can be controlled and varied, in both density and texture, as required for sound proofing, acoustical correction, or appearance of wall finish.

TIGHT FITTING MOLD —

Plain Pallet and bottom of mold are sealed by accurate fitting contact during vibration. Semi-wet mix, for greater strength units, can be used without "bleeding" of cement, fines or water.

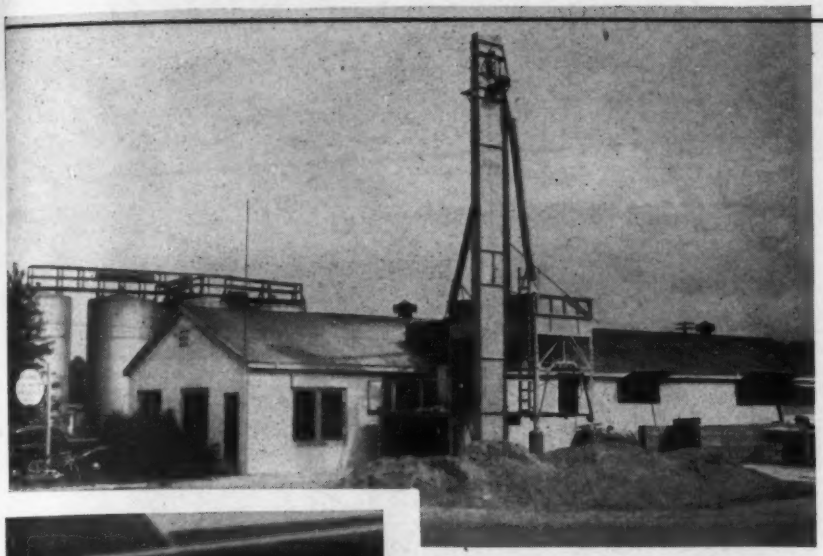


BLOCK CUBER —

The latest Besser development. Provides simplified method for handling block by power. Also provides quick and accurate counting of block. Speeds up delivery.

McDonald Co., Cape Girardeau, Mo., uses the same batching and mixing equipment for both ready mix concrete and concrete products.

By H. E. SWANSON



View of combination ready mixed concrete and concrete products plant with enclosed bucket elevator and aggregate bins in center

Clyde A. McDonald, president

Combine Ready-Mix and Concrete Block Operations

READY MIXED CONCRETE AND CONCRETE masonry unit operations are served by a single travelling weigh-batcher at the new plant of McDonald Co., Concrete Products, Cape Girardeau, Mo. The batcher, suspended from steel track, moves under either of three bins, and discharges the weighed load to transit mixers directly under the bins, or is moved 20 ft. into the main building for discharge to the mixers serving two block machines.

Accurate proportioning of materials has resulted in a uniform mix, both for concrete units and ready mixed concrete, and has gone far to build up a reputation for this company even in the short time it has been in operation, since March, 1946. While this plant is not in the "big plant" classification, it might serve well as an example for the many newcomers to the products field. Emphasis is placed on production of a high-grade block and even though there is a back-log of orders, all block are thoroughly cured in steam rooms as well as in yard storage before delivery.

Sand, crushed stone, and chat aggregates are stored in the bins; one single-compartment 10-cu. yd. wooden bin and one two-compartment Winslow steel bin with 10- and 15-cu. yd. capacities in the two compartments. Aggregates trucked to the plant are elevated by bucket elevator above the

Left: Aggregates for ready mixed concrete and concrete block are proportioned in traveling batcher. Right: Paddle flight drag conveyor, center, discharges into two hoppers above two vibrating type block machines

bins where a swivel chute, controlled from the ground, diverts the materials through pipes to the proper compartment.

Drawn from the bins through manually operated clam-shell type discharge gates, the aggregates are fed to the Winslow, 1600-lb. capacity traveling batcher equipped with a Winslow scale. Two 2-cu. yd. open-top Concrete Transport Co. mixers receive the load directly under the bins. To provide room for the trucks under the bins, a concrete driveway was constructed below ground level. Bagged cement is added from a platform adjacent to the driveway, and water received from the city supply, stored in a 500-gal. tank, is measured out in a 60-gal. tank through a Neptune meter. Weighed aggregates for the block plant are transferred to an 18-cu. ft. Kirkham mixer inside the plant by moving the batcher on the rails. The mixed concrete discharges to a drag conveyor, elevating it to two hoppers above the block machines through split discharge. The ¾-cu. yd. hoppers feed two Kirkham vibrators capable of producing 2000 standard units per day. Blocks are placed on 48-block capacity wooden racks and moved to two steam curing rooms by two Barrett-Cravens lift trucks.

Steam, generated by a Kewanee boiler, is introduced into the rooms at 15 p.s.i. through 1½-in. pipes. The pipes, located at the top of each room and spaced 4 ft. centers, have ⅛-in. perforations to thoroughly spray the product. Perforations have been made in the sides of the pipe to send the steam to the sides of the room for a more uniform curing. Doors of the two kilns are rubber-lined to prevent escape of steam.

Cured block are removed to yard storage where they are sun-cured for a period of four weeks before delivery.

Clyde A. McDonald is president of McDonald Co., Concrete Products.

Plan Two-Shift Operation

HAMILTON CONCRETE PRODUCTS CO., INC., Chattanooga, Tenn., started production of concrete masonry units in March, 1946. Production capacity is about 4500 standard units per 8-hour shift, and as soon as labor is available, two shifts will be in operation. Cinder aggregates are brought in on a switch track of the Southern Belt Line and dumped into an under-track hopper, from which they are sent to one compartment of a two-compartment hopper, with a capacity of 150 cu. yd. per compartment. The other compartment is used to store bulk cement. Both hoppers are loaded by Link-Belt equipment. Gravity flow feeds both the aggregate and cement to a 50-cu. ft. Stearns mixer, then to a Stearns block machine. A Hyster "40" carries loaded racks to six curing rooms capable of handling 20 racks per room. Each rack will accommodate 24 pallets. Steam is provided by a 71-hp. HRT boiler.

The plant was financed by the Smaller War Plants Corp. Co-owners are Carl Lackey and Shelburne Warren. Mr. Warren, who was recently discharged from the Marines, is a brother of Millard Warren formerly of the Southern Cast Stone Co., Knoxville, Tenn., and now with Roy Darden Industries, Inc.

Carl Lackey and Shelburne Warren

Above: Modern concrete block plant recently completed by Alabama Cement Tile Co. Below: High production vibrating type block machine with mixer at floor level

Expand Products Plant

THE CUDAHY CEMENT BLOCK CO., Cudahy, Wis., has purchased additional land for the purpose of building an office building and curing room and providing additional storage space.

Build for Future

ALABAMA CEMENT TILE CO., Birmingham, Ala., is one of the larger plants which recently started production. Cinder units are made, and the plant is equipped with a three-compartment Blaw-Knox bin for storage of aggregate, and a weigh batcher for measurement. Block are made on a Besser Super Vibrapac, moved to curing rooms on a Towmotor lift truck, and cured in nine rooms with a capacity of seven racks per room. The large building housing the equipment is 60- x 144-ft., and ample room has been provided for future expansion. In addition to concrete masonry units, Haydite channels are also produced. A. E. Lloyd is president of the Alabama Cement Tile Co.

Cement Tax Refund

GLENS FALLS PORTLAND CEMENT CO., Glens Falls, N. Y., has received a refund of $88,737.52 from the government for over-assessment of 1942 income tax. The amount of $88,042.51 over-assessment resulted from the allowance of a net operating loss deduction as determined after investigation and determination in the Bureau of Internal Revenue. The balance of the over-assessment represents a portion of the interest assessed on previously asserted deficiency.

High Pressure Steam Curing For Concrete Block

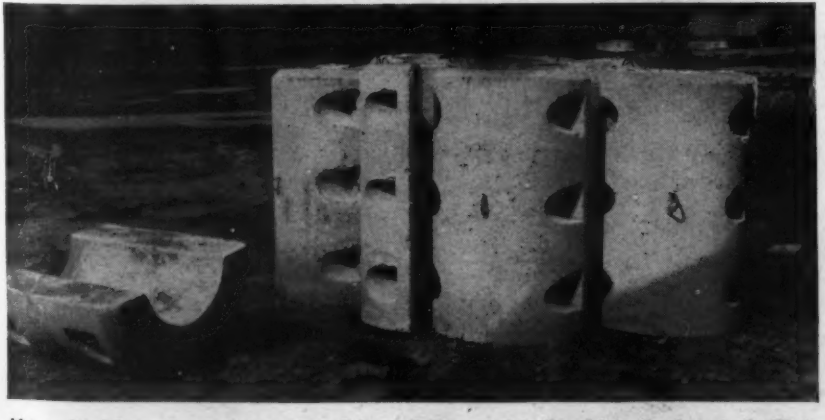
Louisiana Concrete Products, Inc., Baton Rouge, La., also makes revetment block and concrete weights for pipe

LOUISIANA CONCRETE PRODUCTS, INC., has just completed a modernization program that ranks it as one of the outstanding concrete masonry producers in the South. The plant was purchased in September 1945, and modernization was begun immediately. They are now producing all types of building units, and any type concrete specialty for which a market is developed.

Featured at this plant is the autoclave system of high-pressure curing. Block made on a Besser Super Vibrapac are moved to steam curing rooms for initial set by powered lift trucks. The units are steam cured under low-pressure for a period of from two to four hours, after which they are removed and stacked on small trucks for transfer into four autoclaves over narrow guage track. Here the units are subjected to high-pressure curing for a period of eight hours at 125 p.s.i. At the end of this period, the units are removed to yard storage.

The autoclaves are 60 ft. long and 5 ft. 8 in. in diameter. Steam is provided by a 90 hp. horizontal boiler fired by oil. Condensate forming in the autoclaves is forced by the 125 p.s.i pressure into an 888 gal. tank above the boiler, from which it is piped into the boiler to preheat the cold water received from the city water supply. Water also may be received from a 900 ft. well by a 2 in. pump. Steam piped into the autoclaves is evenly distributed over the block through a 2 in. pipe with ⅛ in. perforations spaced at 8 in. centers. This pipe runs the length of the kiln.

W. J. Oliver, Jr., vice-president and manager



Above: Steel forms for casting concrete "clamps." Steam is introduced into the form to facilitate curing. Below: Finished concrete "clamps" used for weights to hold steel pipe in place in rivers with swift current

In addition to standard units, this company has just completed a contract to make revetment block for the U. S. Engineers to be placed in the Mississippi river as an aid in breaking up the eddying action of the current. These units are made with a half-core to increase the weight to a minimum of 55 lbs., as specified by the U. S. Engineers.

Another specialty item manufactured by this company is a concrete pipe weight, designed to keep steel pipe on the bottom of rivers, etc. These pipe weights are cast in specially designed molds, which permits the use of steam to hasten curing and step up production.

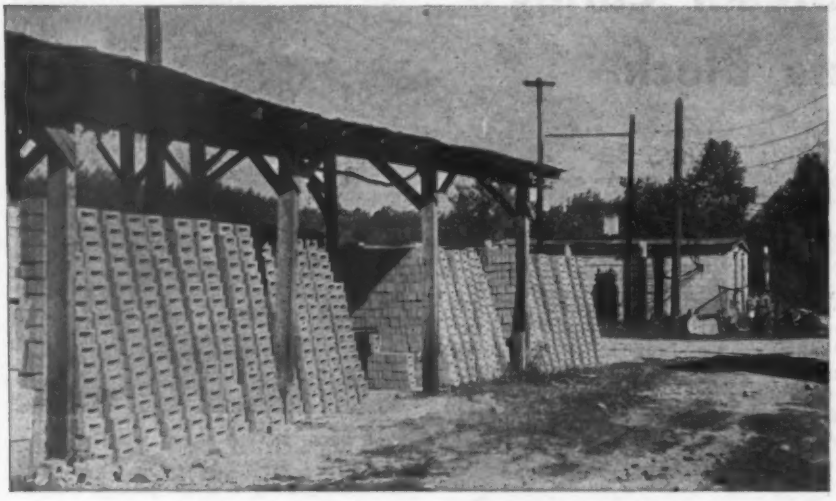
Modernization Program

Part of the modernization program was installation of two steel silos, 40 ft. high and 15 ft. 8 in. in diameter for the storage of aggregates. The aggregates, received in hopper bottom railroad cars, are discharged below the track into a hopper over a belt conveyor. The material is then conveyed to a 56 ft. bucket elevator which discharges into the storage bins. Under the silos, a belt conveyor in a recovery tunnel transports the material to the batcher bin above the mixer for the block machine. The batcher plant has scales for weighing cement, aggregate, and water. Also, included in the modernization program was installation of bulk cement handling equipment. This equipment includes a horizontal screw conveyor and an elevator for discharge into 125-bbl. storage bin, which forms part of batcher bin. To enlarge cement storage capacity, a 700 bbl. silo was installed.

This company has Underwriters'

Laboratories Service on their units, which serves to the advantage of their customers when insurance cost is an item in question.

A. E. Lloyd is president of the Louisiana Concrete Products, Inc., G. C. McCullough is chairman of the board of directors, N. L. Patterson is secretary-treasurer; W. J. Oliver, Jr. is vice-president and general manager.



Showing neat stockpiles of concrete brick under cover

Making Concrete Brick As Quarry By-Product

McCorkle Stone Co. utilizes small stone sizes to make attractive brick

ADJACENT to the crushing and screening plant of McCorkle Stone Co., Milroy, Ind., is the concrete products plant operated by this company. This plant was conceived as an outlet for stone sizes which did not find a ready market in other fields, but the demand has grown until a very substantial business is done in this product.

A Duntile machine is used in making standard size concrete brick, and the 8- x 8-in. and 8- x 12-in. sizes. Stone fines ¼-in. down are used as aggregate. The mix is about five bags of cement for 1000 standard brick. A very close control is kept of the cement-water ratio in order to obtain a product of high strength. Undercover storage is provided for all brick. Mixing is done in a revolving blade, pan-type mixer on a mezzanine floor above the Duntile machine. There is a pants leg type chute with one leg leading to the hopper feeding the Duntile machine and the second leg providing facilities for another brick machine or for concrete which may be used for other purposes. There is plant capacity for 10,000 pallets. The brick have a very pleasing natural tan color as the stone from which the fines are obtained has a light tan color, and a slag portland cement is used which accentuates this color. Brick also are made in other colors to meet any demand.

McCorkle Stone Co. stresses quality in its products, and has been getting business from contractors over a wide area. Many fine residential and business structures have been built with this company's products, and photographs are available to show how attractive structures can be built with concrete brick.

Concrete brick machine with mixer, above, supplying concrete by means of pants leg chute

Cement Subsidy?

PORTLAND, ORE., district office of the Civilian Production Administration, recently asked for either a higher Portland-Vancouver ceiling price for cement, a million-dollar freight subsidy to cover the expense of shipping cement into the Northwest from the midwest and California, or perhaps both in order to relieve the critical need for concrete to build housing and essential non-residential buildings. This answer was given in reply to a request from C.P.A. headquarters in Washington, D. C., for an appraisal of the situation in this area. Nelson English, head of the Portland district office, further advised not to freeze a percentage of cement in an area, but to freeze it all, and then increase the eligible users to include approved commercial projects as well as houses for veterans. Washington authorities requested the report preliminary to the possibility of placing cement on the H-H veterans housing priority list.

Build Phosphorus Plant

VICTOR CHEMICAL WORKS has awarded an additional $500,000 contract to Foster & Creighton Co., Nashville, Tenn., in connection with $3,500,000 phosphorus plant being erected on a 50-acre site at Tarpon Springs, Fla.

Organize Gravel Concern

WHETSTONE SAND AND GRAVEL CO., Big Stone, S. Dak., has been organized by William Gerhardt, Ed Stamp and Bernard and Simon Haugen.

Make Burial Vaults

JOHN H. KAHMAR, who has been associated with the Portsmouth Mixed Concrete, Inc., for five years, has purchased the concrete burial vault division of the company. Mr. Kahmar will operate as Kahmar Burial Vault Service, Portsmouth, Ohio.

Concrete Products Incorporations

Arkose Concrete, Inc., Seattle, Wash., has been incorporated, with a capital of $50,000, to carry on a general manufacturing business, particularly in concrete products. Incorporators are William R. Raylor, Gerry Dendrinos, Harold Klessen, George Mallos, Harry Costa, and C. D. Vallis, all of Seattle.

Concrete Products Co., Danville, Ill., has been organized to manufacture and sell at wholesale and retail, concrete block, tile, vaults, pipe and other concrete products. Authorized capital, 1000 shares common stock, no par value. Incorporators are W. A. Neff, Helena A. Neff, and F. J. Stephan.

Central Mix Concrete Corp., Kokomo, Ind., has been organized with a capital of 1000 shares of $100 par value. Incorporators are Dana A. Scheid, J. Frank Boyer, and F. E. Schortemeier.

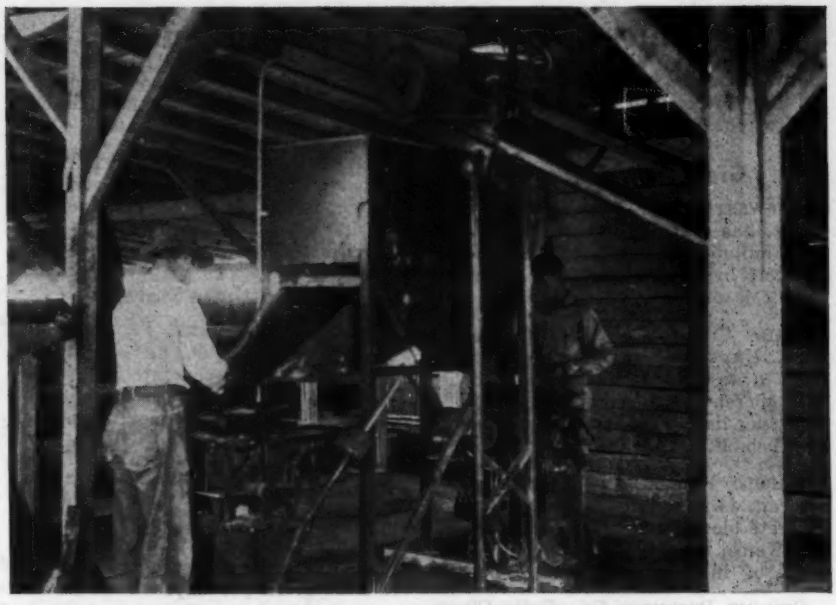
Boylan-Carroll Co., Miami, Fla., has been incorporated to engage in the manufacture of concrete block. Capital, 50 shares, no par value. Incorporaters are Joseph J. Carroll, Ralph F. Marotte, and Josephine Carroll.

Hazleton Concrete Products, Inc., Hazleton, Ind., has been granted a charter, with a capital of 500 shares, par value $100 each. Incorporators are H. M. Arthur, John W. Ford, C. D. Smith and Gerald T. Pea.

Zoggcrete Products Co., Wilmington, Del., has been organized to deal in concrete materials, with a capital of $100,000. Principal office: Tax Research Bureau, Inc., Wilmington, Del.

Superior Cement & Cinder Block Corp., New York, N. Y., has been incorporated by R. Elias, with a capital of 200 shares, no par value.

Tex-Mex Cement Co., Wilmington, Del., has been incorporated to deal in cement, concrete and similar products. Capital, 10,000 shares, no par value. Principal office, The Corporation Trust Co.



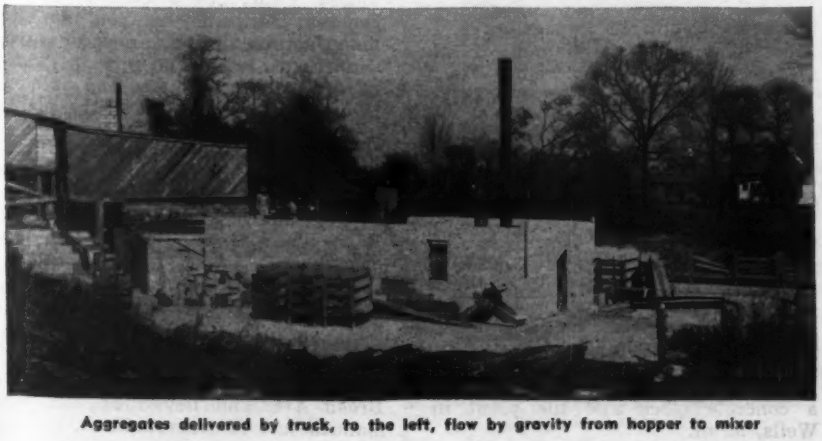
Two block machines fed concrete from single hopper; a third block machine is to be installed

Potomac Concrete Blocks, Dover, Del., has been incorporated, with a capital of $100,000.

Phillips Concrete Co., Inc., Fall River, Boston, Mass., has been incorporated with a capital of 300 common shares, no par value. Officers are William J. Phillips, president and treasurer; Edward M. Thoms, clerk.

Gravity Flow

SNUG HARBOR CONCRETE PRODUCTS Co., Thorsby, Ala., features gravity flow of aggregates. The delivery point of aggregates is about 16-ft. above the main level of the plant, and flow is from storage bin to mixer and to machine by gravity. Block are made on a Stearns Clipper Stripper and moved to curing rooms by a Yale and Towne Blue Streak lift truck. Ten curing rooms have a capacity of 1500 standard units. In addition to block, this plant is producing sill, lintels, joists, and specialty items. H. K. Christiansen, formerly Post Engineer at the Army Air Base at Birmingham, and also formerly superintendent of the Opelika Prisoner of War Camp, is owner.



Aggregates delivered by truck, to the left, flow by gravity from hopper to mixer

Build Second Plant

NORMAN CONCRETE WORKS, Amory, Miss., is operated by former servicemen. R. M. Norman and J. D. Norman, brothers, served in the Signal Corps and the Marines, respectively. In Jan., 1946, they started production of concrete masonry units with two Appley Little Giant machines, a Blatt System mixer, hopper and conveyor, and outside curing. They will build curing rooms in the near future, and are building another plant at Baldwin, Miss., similar to the one now in operation. When completed, both plants will have three machines and steam curing rooms.

Modernize Block Plant

HEDBERG-FREIDHEIM AND CO., Minneappolis, Minn., has modernized and enlarged its concrete block plant to meet increased demand for concrete masonry units. Production has been stepped up from 2500 to 3000 units per day by converting haulage to kilns to the lift truck system. Kiln area and working area in the plant has been materially enlarged. This company also plans to build a new ready mixed concrete plant in downtown Minneapolis on the Great Northern siding next Spring.

Pavement Yardage

AWARDS of concrete pavement for August and the first eight months of 1946 have been announced by the Portland Cement Association as follows:

	Square Yards Awarded	
	August 1946	First 8 Mos., 1946
Roads	1,960,851	16,528,014
Streets and Alleys	1,609,318	8,038,593
Airports	11,947	1,979,722
Total	3,582,116	26,546,329

New Concrete Products Plants

NEW ENTERPRISES for the manufacture of concrete products, according to regions, follow:

Great Plains States

MIDWEST CRETE TILE CO., Norton, Kans., has started construction of its own building for the production of concrete brick, tile and block. Harold Frame is owner of the company.

HAHN COAL & MATERIAL CO., Emporia, Kans., has installed new equipment in its concrete block plant which will increase the capacity to 1000 block per day. The company is owned by Theo. F. Hahn and his son, Paul.

HAROLD FRAME, a returned Navy veteran, is planning to erect a new concrete block plant on US-36 in Norton, Kans., and will manufacture two types of interlocking concrete block.

CEMENT PRODUCTS CO., Falls City, Neb., has started the manufacture of concrete block. Capacity of the plant is 2500 block per day.

DWAIN KIRK has announced the opening of a plant in Plainview, Neb., for the manufacture of concrete block and other concrete products.

BREITSCHWERDT BROS., Wamego, Kans., have purchased the M. K. Olson Concrete Block Co., which recently started operations.

PAUL PRENTICE, Sedan, Kans., is producing 1000 block per day in his new plant. Clifford Prentice, his nephew, is manager of the plant.

JOHN AND EMMET KAYL are opening a concrete block plant in Waterbury, Neb. Capacity of the plant will be 200 block per day.

Midwestern States

J. F. PARKINSON and his brother, F. C. Parkinson, have established a concrete block and tile plant on North Main St. in Fonda, Iowa, under the name of Parkinson Bros. Concrete Co.

CONCRETE PRODUCTS CO., Canton, Ill., has started manufacturing concrete block and ready mixed concrete. Owners of the company are Harry Pinson and James R. Herriott, returned veterans.

MISSOURI VALLEY CEMENT PRODUCTS CO., Council Bluffs, Iowa, is now producing concrete block at the rate of 500 per day. Gene and "Bud" Heffley own and operate the plant.

WALTER BENNETTS AND PETER RELICH, war veterans, have started a concrete block plant in Ironwood, Mich. The name of the company is Bessemer Block Co.

DURACRETE CORP., Canfield, Ohio, has been incorporated by Kenneth G. Hepler, John F. Elsaesser, and Richard B. Wills, to manufacture concrete block, tile and septic tanks. The company is capitalized at $25,000.

HERCULES BLOCK & SUPPLY CO., Toledo, Ohio, has started production of concrete block. Capacity of the plant, which is owned by 13 ex-servicemen, is 3000 block per day.

Northern States

RIVERSIDE CONCRETE PRODUCTS CO., Fergus Falls, N. D., has started the manufacture of concrete block and other cement products. Raymond and Vernon Lee and Helmer Bjerkebek are the owners.

PRECAST CONCRETE PRODUCTS CO., Big Stone City, S. D., operated by Matt Stodolski and Lloyd Scoblic, has installed equipment in its new block plant that will increase the capacity to 2000 block per day.

HILLSBORO CEMENT PRODUCTS CO., Hillsboro, Wis., established recently by Edward Hammer and Wesley Hansber, war veterans, is now in operation. Capacity of the plant is 800 block per day.

ST. JAMES BLOCK & BRICK CO., St. James, Minn., expects to start manufacturing concrete block and brick by September 15. Charles N. Smith and Kenneth Triggs will operate the new plant.

L. D. GUSTAFSON and ED BRANDT have announced that they will build a new concrete block plant on Highway 53, near Cook, Minn.

MCINTOSH COUNTY CONCRETE PRODUCERS CO., Wishek, N. D., is the name of a new concrete block plant to be erected by John H. Wishek.

ROGER DYSON of Minneapolis, Minn., plans to construct a plant in Milaca, Minn., for the production of concrete block, brick and other concrete products.

GEORGE M. FOWLER, Belle Fourche, S. D., has purchased the concrete tile plant formerly operated by D. B. Kline which will be known as the Tri-State Concrete Products Co.

CARL LEMCKE has opened a concrete block plant in Carson, N. D. Capacity of the plant is 250 block per hour.

DE SMET CEMENT PRODUCTS CO., De Smet, S. D., has been sold by Albert R. Johnson to Walter Mortenson of Sioux Falls, Iowa, and Alfred Berg of California.

DELANO CEMENT WORKS, Delano, Minn., recently organized by Leonard Noss and Galen Gilyard, has started production of concrete block. Capacity of the plant is 1000 block per day.

ROGER BUSCHO is planning to open a concrete block and tile plant in Wells, Minn.

MYRON J. MILLER, Minot, N. D., has built his own concrete block machine and is turning out 2500 block per week.

CHAS. NESTERGARD, Norcross, Minn., has started manufacturing 4- x 8- x 12-in. concrete block. Capacity of the plant is 1200 block per day.

LESTER THOMAS, Red Wing, Minn., has started operating a concrete block plant. Capacity of the plant is 5000 block per day.

Southern States

ACME CEMENT PRODUCTS CO., INC., Natchitoches, La., has started production of concrete block, septic tanks, pipe, precast steps, joists and lintels in addition to ready mixed concrete. Sam Hicks is general manager of the plant, and Paul Welsh is in charge of the ready mixed concrete and all precast items.

FRANK LITTLE, Morrillton, Ark., plans to start the manufacture of concrete block.

Pacific Coast States

H. A. MUNDINGER and WRAY O'NEAL have started a concrete brick and block plant in Stevenson, Wash., that will produce approximately 3000 brick per day on equipment manufactured by Stephen Flam of Van Nuys, Calif.

A. K. CONCRETE PRODUCTS CO., Watertown, Wis., operated by V. G. Fiegel, has started production of concrete block. Later on, concrete pipe, silos and other concrete products will be manufactured.

BLOX INCORPORATED, Edmonds, Wash., is planning to construct a modern concrete products plant having approximately 5000 sq. ft. of floor space.

MCMILLAN CONCRETE BLOCK CO., Tacoma, Wash., has increased the capacity of its plant to 2500 block per day.

Rocky Mountain States

VALLEY CEMENT PRODUCTS CO., Alamosa, Colo., has started producing concrete block and, later on, plans to manufacture lintels, grease traps, sand traps, brick, and pipe. A. "Jerry" Crawford, architect and builder, is owner and operator of the plant.

REIMER-EMERINE CEMENT BLOCK CO., Florence, Colo., is now in full production of concrete block with a capacity of 1000 block per day. A. L. Reimer and G. A. Emerine are the owners.

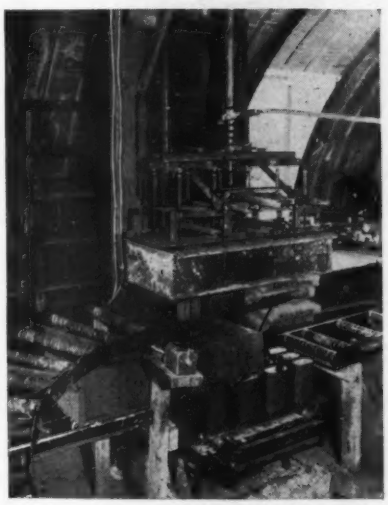
Eastern States

BOWEN BUILDING BLOCK & SUPPLY CO., Binghamton, N. Y., is planning to construct a $66,000 building at Broad Ave. and Bevier St., for the manufacture of concrete block.

Production Line Block Manufacture

GYRO MANUFACTURING CO., Kansas City, Mo., has developed a concrete block manufacturing system which includes a production-line conveyor. The complete installation includes the vibrator table to which is attached a powerful electro-magnetic vibrator oscillating at the rate of 3600 times per minute; the patented Gyro stripper; five forming boxes to make five 8- x 8- x 16-in. concrete blocks; 200 steel pallets used to carry the concrete blocks on the conveyor; and a ball-bearing, gravity-feed, roller conveyor system which carries the blocks from the time they are cast until they are ready for delivery.

Core boxes are poured and vibrated in one operation and then are rolled toward the Gyro stripping machine. There the stripping is done, and another reinforced, multiple pallet is inserted. With a flip of the switch, the core carrier is pressed downward out of the steel form box on to a lower movable platform which also has a roller conveyor mounted to receive the core carrier. At the same time the cores are forced down, the upper platform attaches itself to the form box. The reverse switch is thrown and the form box moves rapidly upward, stripping the box from the blocks and leaving them resting on the multiple pallet. The pallet, holding the five blocks, then rolls forward on the ball-bearing conveyor to the curing tunnel. When the blocks have cleared the machine, another pallet is inserted and the process is continued.



Close-up of stripper, showing a bank of five blocks about to roll from the stripper onto the conveyor line toward the curing tunnel

It is claimed that 10 blocks per minute can be easily made with this machine, and that an experienced operator could perform the stripping operation in 10 seconds, handling 30 blocks per minute. The speed of the Gyro stripper is due to the telescoping process used in stripping the core box from the concrete blocks. When the switch is thrown, it sets in motion the electric motor which drives the worm gear lift causing the upper platform to move upward thus stripping the steel, multiple forms from the blocks. At the same time, the lower platform brings the core carrier up to the telescoping position. This is accomplished speedily because the lower platform moves upward, after a delayed action, at four times the speed of the upper table. The instant the telescoping movement is complete, the form box is released onto the core carrier which rests on the rollers of the lower table. They are then in the exact position to start their return by gravity back to the mixer-vibrator position. This operation is simply repeated on each of the several boxes in the circular race-track pattern.

Quonset hut used to house block plant equipment

Make Mortarless Units

MORTARLESS MASONRY CO., Springfield, Mo., is now producing four sizes of concrete units on four Mortarless Tile Machines. This company is also the midwestern representative of the block machine company, serving seven states in the midwest. Production capacity for each machine is about 120 units per hour. J. Q. Hammons and D. J. Mescher, co-owners, are returned veterans.

D. J. Mescher, left, and J. Q. Hammons, partners in new company

Veterans Start Block Plant

STEWART AND GEORGE TATUM, returned veterans, have started production of concrete masonry units under the name of Mortarless Masonry Co.,

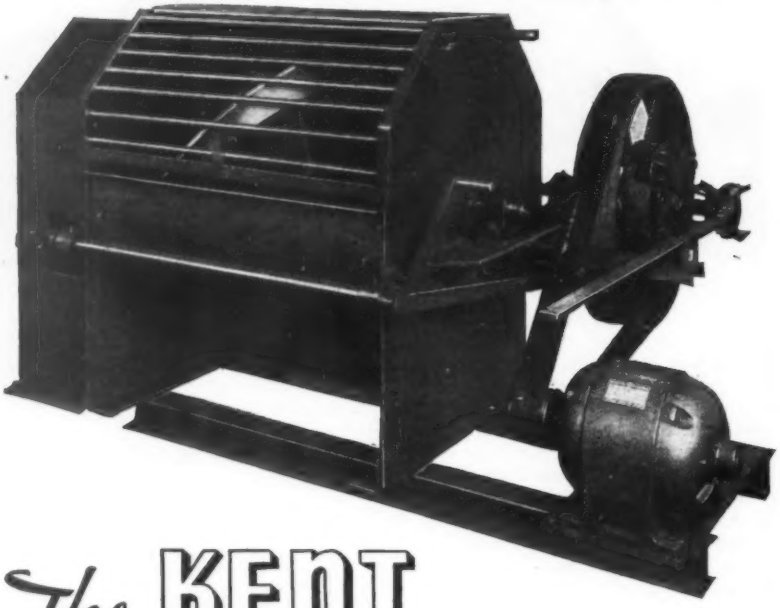
George H. Tatum

at Joplin, Mo. George Tatum, released in July, 1944, spent one year as 2nd Engineer with the Army Transport Service. Stewart Tatum, released in December, 1945, was a Lieutenant Senior Grade and spent four years in the service, part of the time in the Pacific Theatre.

Start Block Production

CITY BLOCK AND PRODUCTS CO., Independence, Mo., started production of concrete block in May, 1946, with a home-made vibrator, producing 2000 units per day. In July, a Stearns Clipper-Stripper was added, doubling production. J. D. Williamson and J. M. Goodridge are co-owners.

Machine of Many Features
ONE OF A COMPLETE LINE



The **KENT**
BATCH MIXER

This mixer has every wanted feature in greater measure than heretofore available.

Conservatively rated capacity — ease and safety of operation — fast, thorough mixing — rugged design and durability.

Chrome plated, abrasion resisting blades — renewable bar liners — safety grill — clean dumping discharge door — dust-proof, anti-friction bearings — Zerk grease fittings — positive V-belt drive — reliable KENT clutch.

These features of proven value are built into six mixers of uniform design having capacities *under the paddle shaft* of 12, 18, 24, 30, 42 and 50 cubic feet.

Write for literature describing this unit or any other KENT machine listed below. Simply check the items of interest, tear off, write name and address in the margin — and mail.

The KENT MACHINE COMPANY
Manufacturers of CONCRETE PRODUCTS MACHINERY *Since 1925*
CUYAHOGA FALLS, OHIO, U.S.A.

☐ KENT Batch Mixers
☐ KENT Continuous Mixers
☐ KENT Aggregate Elevators
☐ KENT Elevators
☐ KENT Lift Trucks
☐ KENT Strippers
☐ KENT Steel Racks
☐ KENT Feeders
☐ KENT Pallets
☐ KENT Tampers
☐ KENT Dunkers

R. P.

Sand Moisture Meter

J. THOMAS RHAMSTINE, Harlingen, Texas, has developed a meter for the quick determination of free moisture in concrete sand. The device is electrically operated, and has a specially designed "prod" or pick-up which is merely inserted in the sand to obtain a reading. It is a constant operating device; the prod could be mounted in the batching hopper, the meter needle indicating continuously the percentage of free moisture.

It is said that the meter is easy to install, the user merely standardizing the meter for the particular sand being used, which is explained in the instructions. Once set it requires no further calibration for that one specific quality or type of sand. The meter is to be nationally distributed by the Valley Ready-Mix Concrete Co., Harlingen, Texas.

Electric meter for determining moisture in sand

The principle of operation is a reading of the a.-c. impedance of the sand. An audio-oscillator generates a definite cps of low current value which feeds the prod and in turn passes through a bridge system and rectifier to a meter calibrated in percentage of free moisture. Considerable research was involved in providing for corrective settings for the saturated, surface-dry condition of the sand and the contained mineral salts.

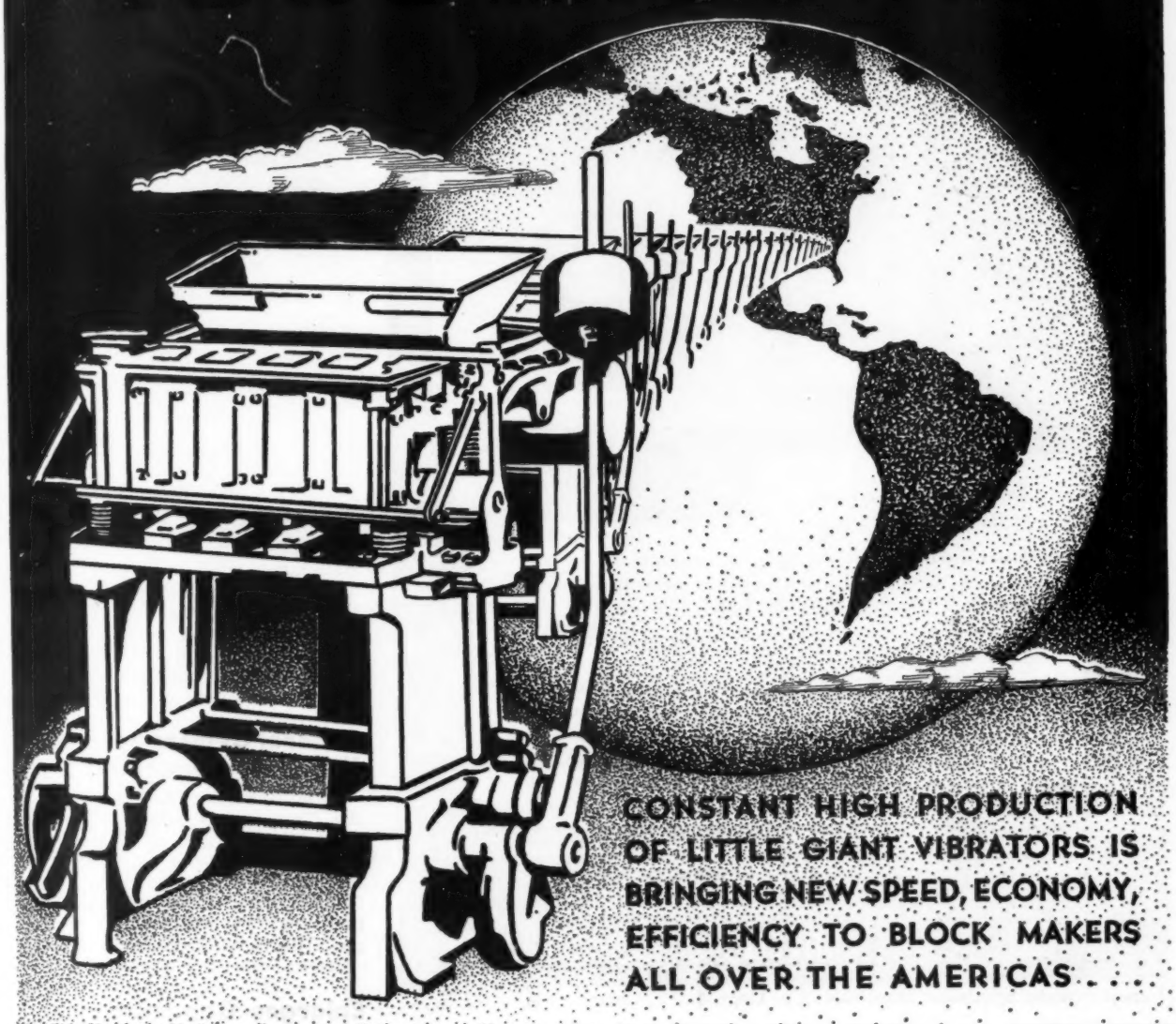
Cement Dust Case

MANITOWOC PORTLAND CEMENT CO., Manitowoc, Wis., recently installed dust collector equipment to eliminate as far as possible the discharge of dust from kiln stack. Hearings have been held before the City Council to determine how effective the new dust collection system has been functioning. Due to war-time priorities, all the equipment had not been available.

Reject Bargaining

EMPLOYEES of the Monarch Cement Co., Humboldt, Kan., recently rejected a proposal for collective bargaining in an election held at the plant for that purpose, according to a local report. The proposal was defeated with a vote of 95 to 64.

In Nine Months



CONSTANT HIGH PRODUCTION OF LITTLE GIANT VIBRATORS IS BRINGING NEW SPEED, ECONOMY, EFFICIENCY TO BLOCK MAKERS ALL OVER THE AMERICAS . . . .

Little Giant Vibrators are building blocks that build good will everywhere.

Precision machining is a big part of the story.

J. W. Appley & Son Little Giants have a minimum of wearing parts. Under wartime pressure and stress, blocks continued to roll from little Giants when other machines gave up the ghost and passed into disuse.

Because Little Giants are precision built, J. W. Appley can assure you that when parts for replacement are needed, they are **immediately available.**

Operating a block plant with Little Giant guarantees you maximum–**constant**–production.

Dealerships are available. Write, or wire at once for full details.

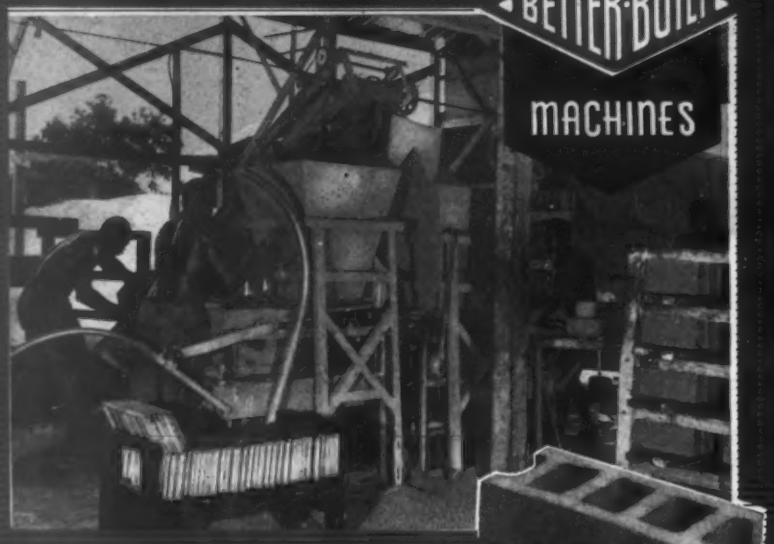
J. W. APPLEY & SON

Cornerstone of Success

GRAVELEY

BETTER-BUILT

MACHINES



Reach NEW HEIGHTS *in* PRODUCTION *and* QUALITY

Operators old and new are stepping up production and improving the quality of their blocks and increasing profits thru Graveley "Better Built" Concrete Block Machines.

Put a Graveley to work for you. One machine makes eight sizes of blocks, a truly versatile, practical money-making machine. There are two models, a 2-cell and a 3-cell, both two unit jobs. Two Graveley machines operating from a single mixer and conveyor will produce well over 3,200 blocks a day.

Put this Graveley job to work for you. Provide for every possible customer demand in both style and size range of block.

BOB GRAVELEY INDUSTRIES, Inc.
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GRAVELEY BETTER-BUILT MACHINERY

Export Agents: Southeast Steel Sales Co. Dept. 1 Orlando, Fla, U. S. A.

"ANCHOR"

Complete equipment for making concrete, cinder and other light weight aggregate units, including engineering service for plants and revamping of old ones for more economical service. Stearns Clipper Stripper Machines, Stearns Joltcrete Machines; Stearns Mixers; cast Iron and Press Steel Pallets. Straublox Oscillating Attachments, etc.

Repair parts for: Anchor, Stearns, Blystone Mixers and many others.

ANCHOR CONCRETE MCHY. CO.
G. M. Friel, Mgr., Columbus 8, Ohio

Block Plant Changes Hands

POPLAR BLUFF BLOCK CO., Poplar Bluff, Mo., formerly known as Griffith Block Factory, has been operated since July, 1946, by Burnie Pearce and Alva Hays. Mr. Pearce is a re-

Burnie Pearce

turned veteran, serving for six years in the Navy as Chief Water Tender. He served on the destroyer U.S.S. Hammond, sunk at Midway, on the destroyer U.S.S. Gansevoort, and on the fleet tanker Atascosa. Mr. Pearce was in the battles of the Coral Sea; Guadalcanal, and the Aleutians; served in the occupation of Iceland; and finally wound up in Tokyo.

Federal Cement Purchases Under New Specification

ANNOUNCEMENT has been made by the Treasury Department Procurement Division that as of July 21 all federal purchases of portland cement will be under the new federal specification, SS-C-192. This is the first time that the federal specifications have provided specifically for air-entrained portland cements.

Enlarges Capacity of Block Plant

M & M CONCRETE PRODUCTS CO., Montgomery, Ala., has increased the capacity of the plant by installation of a No. 9 Stearns Joltcrete to replace an old Stearns Clipper Stripper. A new 50-cu. ft. Stearns mixer has also been added. This installation was made early in April. Neal S. McGaffey is the owner of the M & M Concrete Products Co.

Ready Mix Plant Fire

LINTHICUM CERTIFIED CONCRETE CO., High Point, N. C., reported a fire had destroyed a two-story frame building, damaging a considerable quantity of cement in storage.

AVAILABLE!! NOW!!

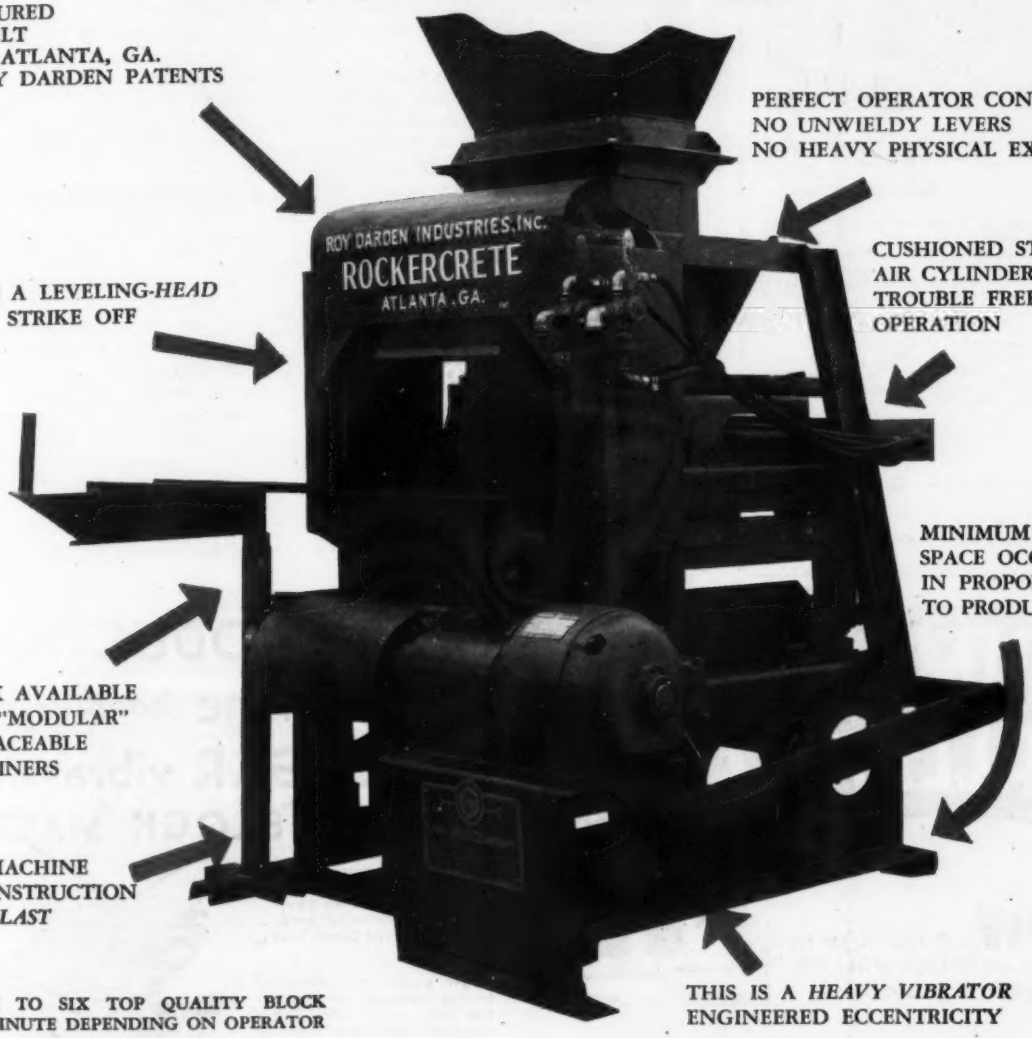
The New Improved "ROCKERCRETE" *Block Machine*

"PLEASE YOUR BANKER"—MORE PRODUCTION PER MACHINE DOLLAR
"NOT A TOY": MAKE SPECIFICATION, Even Density Blocks.

Most Ingeniously Designed Machine in Medium Field

MANUFACTURED BY LINK-BELT COMPANY, ATLANTA, GA. UNDER ROY DARDEN PATENTS

PERFECT OPERATOR CONTROL
NO UNWIELDY LEVERS
NO HEAVY PHYSICAL EXERTION



CUSHIONED STROKE AIR CYLINDER . . . TROUBLE FREE OPERATION

THIS IS A LEVELING-*HEAD* NOT A STRIKE OFF

MINIMUM FLOOR SPACE OCCUPIED IN PROPORTION TO PRODUCTION

MOLD BOX AVAILABLE FOR NEW "MODULAR" SIZE, REPLACEABLE CORES & LINERS

RUGGED MACHINE FRAME CONSTRUCTION MADE TO *LAST*

THREE TO SIX TOP QUALITY BLOCK PER MINUTE DEPENDING ON OPERATOR

THIS IS A *HEAVY VIBRATOR* ENGINEERED ECCENTRICITY

[OTHER EQUIPMENT AVAILABLE FOR COMPLETE PLANTS]

- **STEEL AGGREGATE BINS**
- **FEED HOPPERS**
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- **BUCKET ELEV. UNLOADERS**
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BLOCKS MOVED EASILY

Detachable truck body can pick up from 75 to 200 concrete blocks.

Save LABOR! Save BREAKAGE!

Concrete block makers can save up to 25% on labor costs and can reduce breakage 50% with a **Brooks Load Lugger** hoisting unit installed on one truck. Above is seen a bottomless type body being lowered over a stack of cured blocks. Steel rods are passed through the block openings in the bottom layer and through corresponding openings in the sides of the container. Chains are then attached and entire load is hydraulically lifted to flat bed of Load Lugger on truck. Takes 15 seconds to unload complete stack at construction site. Write for catalog today.

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Portland Cement Technology

For a number of years no comprehensive book on cement manufacture has been published although quite a number of changes have occurred in technology. To bridge the gap since R. K. Meade's Portland Cement (now out of print) was published, Dr. J. C. Witt, technical director, Marquette Cement Manufacturing Co., has written a book entitled, "Portland Cement Technology." The book is published by Chemical Publishing Co., New York, N. Y.

Cement technology has been traced from its early rudimentary stages to its present highly scientific status. The treatment of the various chapters is based primarily on materials rather than on plant equipment. The author has drawn from his published papers, unpublished manuscripts, notes, and calculations, and the existing literature on portland cement. The book is designed to be a practical text and reference book for technical and non-technical men interested in the cement, concrete, and allied industries.

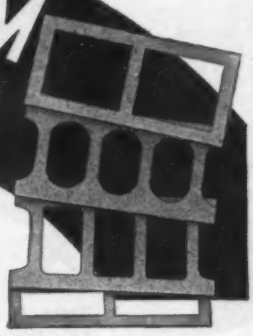
Contents of the book include chapters on the following subjects: History of the Cement Industry; Raw Materials; Proportioning Raw Materials; Preparing the Raw Mix; Fuels; Clinkering; Power; Grinding the Clinker; Storing, Packing, Loading and Shipping; Plant Design; Experimental Engineering; Nature of Cement; Analyses and Tests; Concrete Materials; Proportioning Concrete Materials; and Concrete Technology.

Dr. Witt, the author, is a graduate in mechanical engineering at Armour Institute of Technology, a fellow of the American Society of Mechanical Engineers, and a member of the American Society of Civil Engineers. Information for the book has been drawn from the author's years of experience in the cement industry covering prospecting for raw materials, plant operation, engineering, research, development, consultation, and administration. Each chapter has been reviewed by a specialist on some phase of the subject matter.

Small Block Machine

Century Cement Products, San Diego, Calif., is now in production on a vibrating block machine made in two models. Model 1-C will produce 1800 to 2000 masonry units, and Model 2-C has a capacity for 2500 to 3500 units in an 8-hr. day. An automatic switch shuts off the machine power with the weight of a block on the pallet. The grooved face type block is made on this machine, with grooves provided for reinforcing steel required for California construction. Electrical conduit and other utilities can be located in the grooves.

ALUMINUM PALLETS



NOW **is the time to insist on V-LINE PALLETS for your new block machine.**

Nearly all block plants would like to have a really satisfactory aluminum pallet; due to ease of handling, less block breakage, lower shipping costs, etc. V-LINE pallets in many sizes sell for less than iron pallets, yet always retain 30% of original value in aluminum.

Wide and enthusiastic acceptance of this super-strength pallet by the industry, plus our expanded mass production facilities, have kept cost down and deliveries up. Write, wire or phone for new price list.

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HIGH PRODUCTION with the *trouble-free* EDGAR vibra-shaker BLOCK MACHINE

2000 perfectly formed, dense, water-resistant blocks in an eight-hour working day! That's the splendid production rate of the Edgar Vibra-Shaker.

High pressure lubricated bronze bearings on the entire lift assembly—heavy electrical equipment—sturdy construction throughout—these features assure TROUBLE-FREE block making.

Vibra-Shaker produces in one operation one 8x8x16 and two 8x4x16 uniformly textured blocks. A simple partition changeover, performed in a few minutes, produces two 8x8x16 or two 4x4x16 blocks.

Price $1,050

With Partition Tile Changeover $100 additional

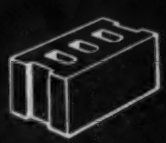
Mixers, conveyors, water control units and hoppers are available.

EDGAR'S BLOCK MACHINE WORKS

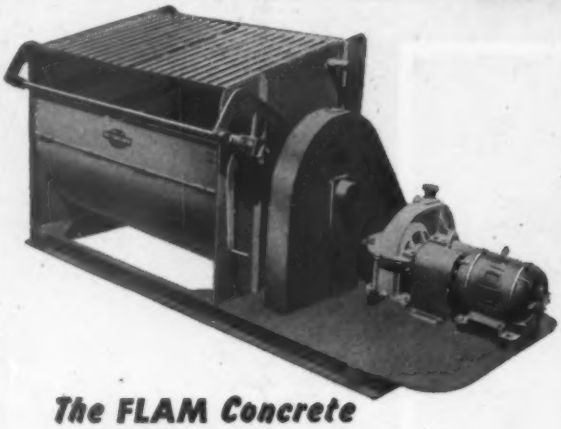
ORMOND • FLORIDA

"Will Your Block Plant Be a Shoemaker's Child?"

Tradition has it that the shoemaker's children are forced to go barefoot because their father, interested only in making shoes for customers, neglects footgear for his family . . . Will your new Concrete Block Plant be a shoemaker's child? . . . Take advantage, instead, of a golden opportunity to advertise the beauty and utility of the material you sell,—by building it of block . . . And to be certain of beauty in the architectural proportions of your plant and maximum utility and efficiency in its function,—take advantage of the Butler Bin Company's profound experience and engineering ingenuity in developing COMPLETE designs that mean less cost per block.



BUTLER BIN CO. • *Waukesha, Wisconsin*



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. . . setting new standards in Concrete Mixing equipment. Greater volume production with lower cost. Simple and safe to operate. Built of durable steel. Replaceable inner liner. Adjustable and replaceable paddles. All moving parts covered for dust proofing and safety. ● Write for complete information about FLAM Concrete Equipment.

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on All Flam Equipment

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★ No. 12 BLATT MIXER
★ No. 1220 BLATT CONVEYOR
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★ BLATT WATER CONTROL UNIT
★ LIFT-TRUCKS ★ PALLETS

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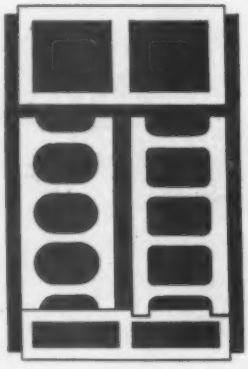
"GUARANTEED* ALUMINUM-COPPER PALLETS"



Pallets for all machines in two and three cell. If our pallet breaks from abusive use, return the aluminum-copper and we will replace the pallet for cost of labor on a new one, 30c.

Special pallets made to order, send drawing or sample at once.

Pallets for making 8 x 8 x 16 blocks two and three cell available for immediate delivery.

Pallets for making partition blocks two and three cell available for immediate delivery.

*INCREASE YOUR PRODUCTION BY USING GUARANTEED "WELL-BUILT" ALUMINUM-COPPER PALLETS

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Exclusive Export Distributor of Graveley "Better-Built" Block Machinery
We ship to all foreign countries. Write for prices NOW.

MAKE 6" to 48" CONCRETE PIPE With One MACHINE

680 STROKES PER MINUTE

A tamping capacity that turns out pipe faster, and at greater profit. One machine will produce all sizes of concrete pipe from 6" to 48". We can also outfit you for making larger sizes up to 135".

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UNIVERSAL CONCRETE MACHINERY COMPANY, INC.
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TRUK-LODER *attached to your* DUMP TRUCK . . . Loads 4 to 5 ½ yard scoops per minute.

- ½ cubic yard Scoop, easily attached and removed
- Special Crushed Stone Scoop available
- Perfect for clean-up work
- Truck hydraulic hoist furnishes lifting power
- Driver operates loader from cab
- All operations in front in full view of driver
- Sturdy, dependable, economical

Write for prices and specifications.

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THE LEADING MANUFACTURER OF LIFT TRUCK RACKS AND BLOCK CARS
for the Concrete Products Industry

● Style 294 Hinged Deck Lift Truck Racks in block plant of Cleveland Builders Supply Co., Cleveland, Ohio.

ANY STYLE OR DESIGN LIFT TRUCK RACK OR CAR FOR YOUR PLANT

THE CHASE FOUNDRY & MANUFACTURING CO.

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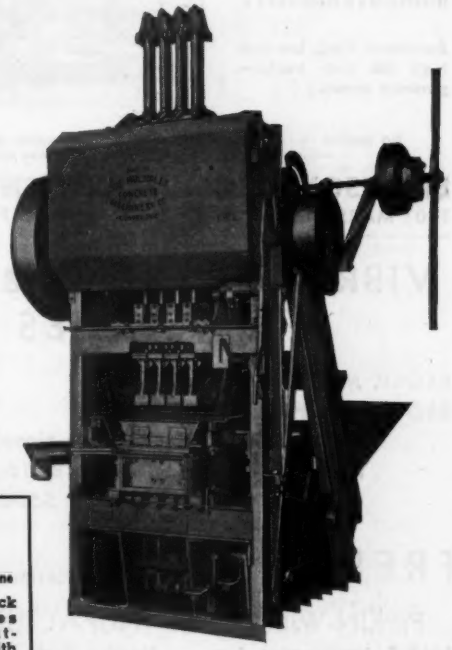
Large Volume Production to Meet Today's Demands

MULTIPLEX
SUPER TAMPER

● Consistently builds high quality brick, tile or block at the rate of 4 to 6 units per minute from any aggregate. Many manufacturers are making a lasting reputation with the Multiplex Super-Tamper.

● Engineered for simple operation and trouble-free service; 8 tamper bars, positioned-timed feeding and stripping, 5-point action clutches.

● Built for a lifetime of rugged service, with all-welded frame and reinforced mold box.



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A Profitable Sideline

Multiplex Flue Block machine makes solids of lightweight units, with attachments for ventilator and stove-pipe openings. Simple and profitable to operate.

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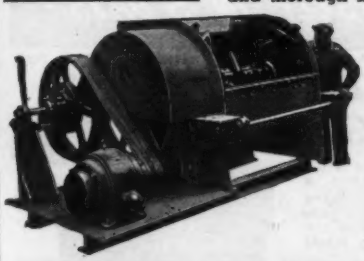
with reverse screw-type action insures fast and thorough mixing of every batch. This is the machine for an "assembly line" uniform product at all times.



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Makes Concrete Brick and Solid Blocks. Portable. Hand Tamped.

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Hand and Power operated built for the concrete products industry.

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Makes Cored Blocks, Portable, Hand and Power tamped.

QUICK DELIVERIES

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ERICKSON POWER LIFT TRUCKS

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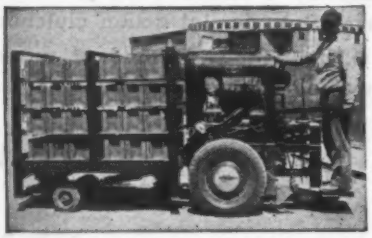
Pneumatic tired, low and high lift fork trucks—platform trucks.



No paved runways needed—Speedy hydraulic platform raiser —Simple controls. Write for complete details.

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VIBRATOR BLOCK & BRICK MACHINES

BLOCK MACHINE (Single) $700

BLOCK MACHINE (Double) $900

BRICK MACHINE (12 at a time) $700

PARTITION MACHINE (4x8x16) $700

½ cu. yd. MIXERS $500

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LITTLE DAVE BRICKMAKER

WRITE TODAY FOR THE FACTS

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ALSO THE NEW VI-BRIK-CRETE AVAILABLE IN LIMITED QUANTITIES

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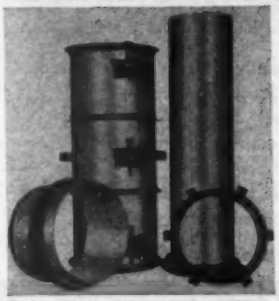
ATLAS Concrete Pipe Forms



Typical Atlas Concrete Pipe Form. No clamps, hooks or gadgets to get out of order.

YOU SAVE Time and Money with ATLAS CONCRETE PIPE FORMS because you can count on them to stand up under hard usage, hold their shape and turn out high grade pipe over a long period of time . . . pipe which is smooth, round and true with joints that fit accurately together.

Operation is speedy both in setting up, filling and removal of pipe. Write for complete facts. Ask for illustrated bulletin.

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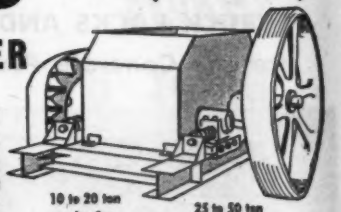
The crushers of low operating and maintenance costs. Gives complete, efficient crushing in ONE operation for block making. Hundreds of satisfied users in the U.S. and Canada. Write, or phone GARFIELD 5712 for free descriptive folder.



10 to 20 ton per hr. Cap. $345.

25 to 50 ton per hr. Cap. $795.

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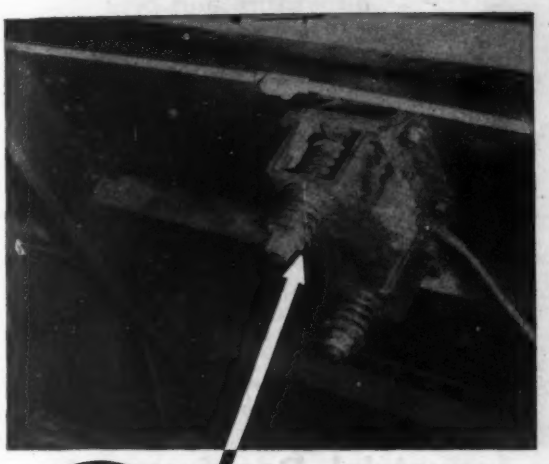
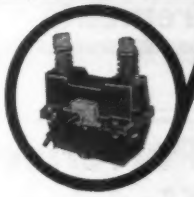
SYNTRON

"Pulsating Magnet"

ELECTRIC VIBRATORS





KEEP BINS, HOPPERS AND CHUTES OPEN AND FREE FLOWING

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Available in 8 different sizes, from a little 4 lb. model up to a big 660 lb. model—they can be applied to any type of bin, hopper or chute.

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2. Capacity of hopper—cu. ft.
3. Type of material being handled
4. Weight per cu. ft.—characteristics

The above information, together with a rough dimensional sketch, will enable our engineers to give their recommendation and quote prices.

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all sizes

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. . . and everything rubber for Industrial Requirements

FOR DETAILED LISTINGS SEE CARLYLE AD ON PAGE 177

The Williams "SLUGGER" Crusher and Pulverizer Handles "ONE MAN" Stone • Saves Sledging

Also Makes 1¼", ¾" or Agricultural Limestone in One Operation

CUTAWAY VIEW of "Slugger" showing heavy duty hammers, liners and discs.

By reducing large rock to 1¼", ¾" or agricultural limestone in one operation, the "Slugger" has enabled operators to produce these sizes at a low cost per ton and with small investment.

Features include—Manganese steel hammers, heavy duty bearings, adjustable breaker plate, hammer adjustments overcome wear, economical to operate.

The "Slugger" is built in Seven Sizes — from 30 to 150 horsepower — write for illustrated bulletins today.

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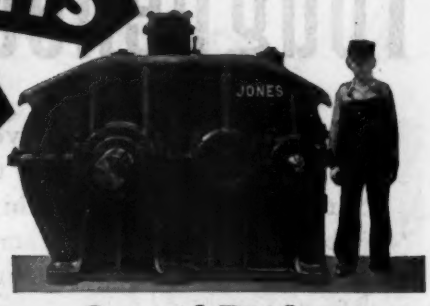
Williams
PATENT CRUSHERS GRINDERS SHREDDERS

Whether you need THIS —or THIS



You can get what you want in the complete range of Jones Herringbone Speed Reducers

YOU will find this 128-page catalog of Jones Herringbone Speed Reducers helpful in the selection of reducers in accordance with A.G.M.A. recommended practice for all conditions of service. Jones Herringbone Speed Reducers are built in single, double and triple reduction types and in every standard ratio in ratings ranging from 1.25 H.P. to 440 H.P.

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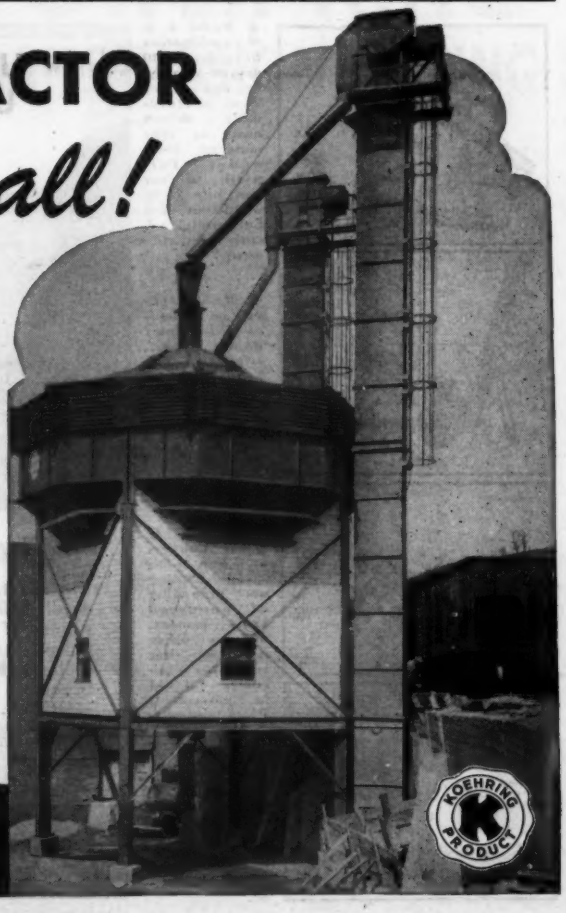

Most important in central mix plant design is the specialized *engineering know-how* that fits your plant to your location, takes into consideration cement and aggregate delivery, storage capacity, required output, product delivery and possible expansion to fit future needs.

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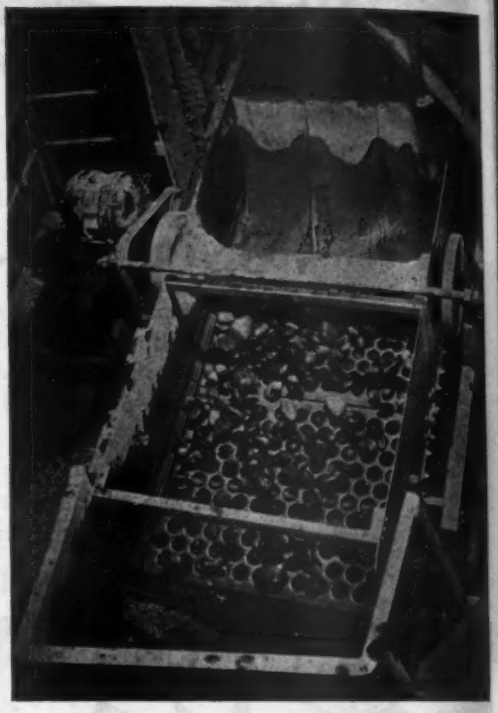

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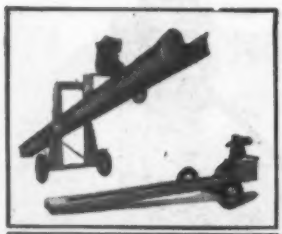
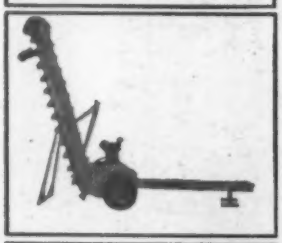
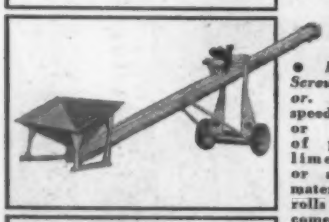


● *Model L & M Combination Unloader* (180 degree conveyor and piler) Two individually driven units to take material from under full width of car and pile it in a 90-foot long half-circle. A truly versatile setup!



● *Model ASL-2B Car Unloader* (With Belt) Bucket type... requires no pit. Takes material from across entire car, either above or under the rails.



● *Model Q Screw Conveyor.* For high speed loading or unloading of powdered lime, cement, or any other material that rolls or becomes liquid in movement. Precision-built.
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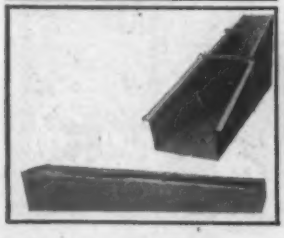

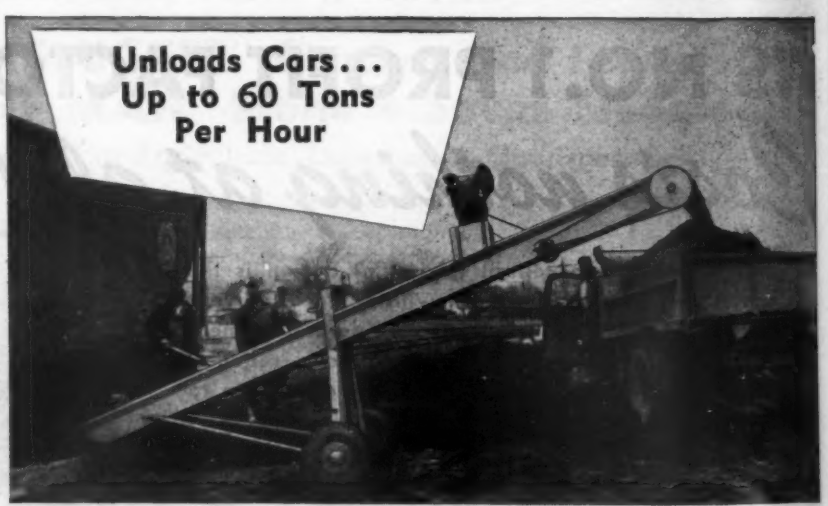

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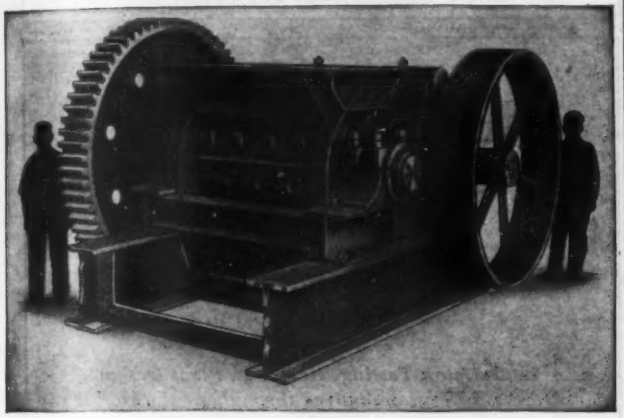

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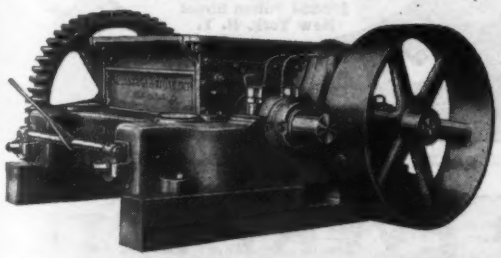

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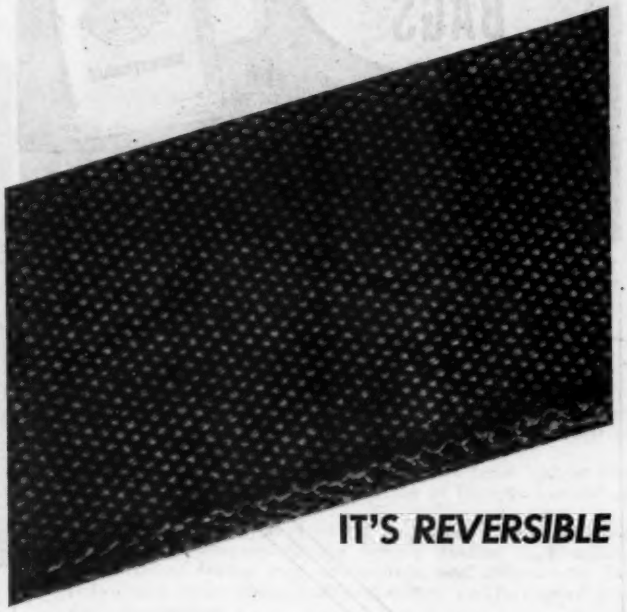

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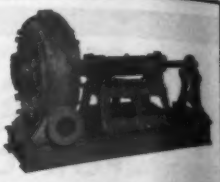

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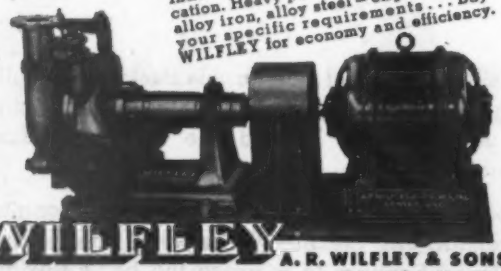

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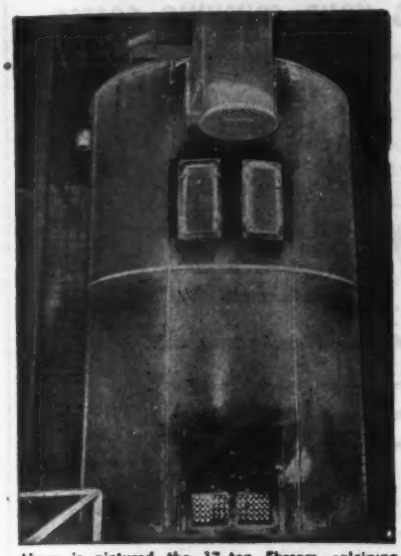

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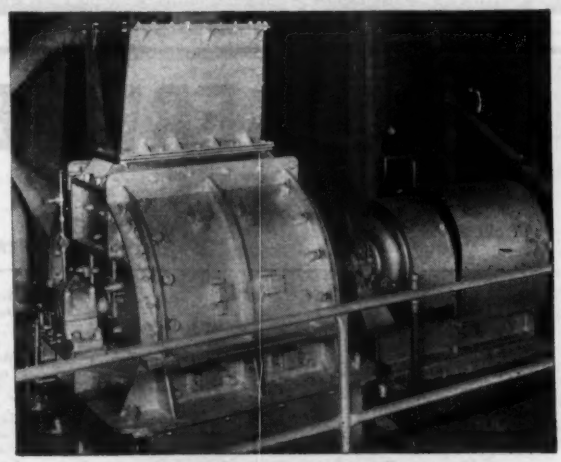

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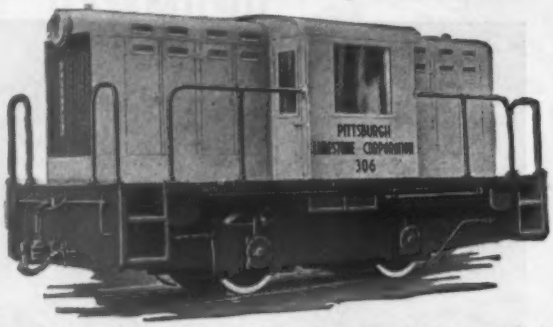

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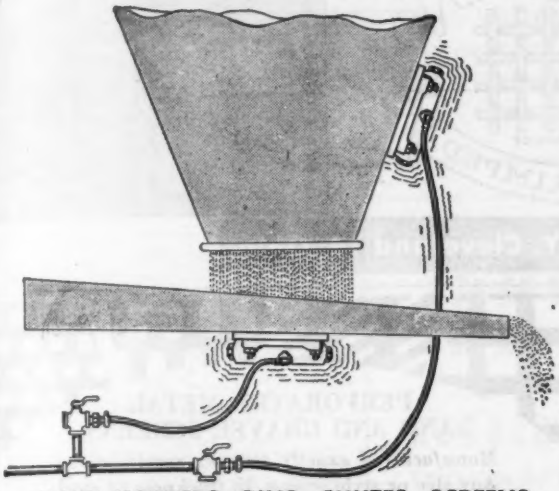

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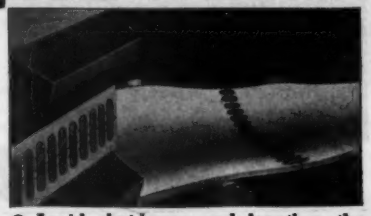
HD BELT FASTENERS



● **FLEXCO H D RIP PLATES** are used in repairing rips and patching conveyor belts. The wide space between outer bolts gives the fastener a long grip on the edges of the rip, while the center bolt prevents the fasteners from bulging.

● **FLEXCO H D BELT FASTENERS** make a strong, tight butt joint with long life. Recessed plates embed in belt, compress belt ends and prevent ply separation. Six sizes in steel and alloys.

● Avoid shutdowns and lengthen the life of your conveyor belts and bucket elevator belts by using Flexco HD belt fasteners and rip plates. Thousands of companies have stepped up the performance of conveyor lines and cut costs by using Flexco methods.

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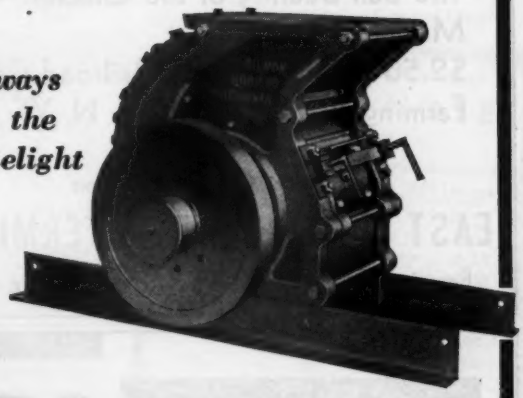

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FOR SALE

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900' Prewar 8-ply 48" wide Conveyor Belt
48" Smooth Top Plate Conveyor, 25'
Belt Pulleys, Idlers, Bearings, Gears, Belt
Merrick Weightometer for 20" Belt or Less
3 Bushman Vibrators for Picking Tables
Belt Trippers for 14", 16", 18" and 20"
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Gravity Roller Conveyors, 6" to 20" wide
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6"x38' Continuous type Bucket Elevator
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3'x5' and 4'x5' 2-deck Hummer Vibr. Screens
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2—No. 0 Sturtevant Rotary Fine Crushers
No. 16-40 Gruendler Peerless Grinder
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2"x6" Sturtevant Roll Jaw Laboratory Crusher
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4"x6" A-C. Roll Jaw Laboratory Crusher
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11" Traylor Bulldog Gyratory Crusher
12"x22"-D Acme Jaw Crusher
24"x24" Single-Roll Knobbed Crusher

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2-drum 15-hp and 1-drum 10-hp Nova Hoists
1-drum 25-hp Mead-Morrison Hoist
1-drum 50-hp McKiernan-Terry Hoists
12 Gear Reducers. Also 5-hp and ½ hp Reeves Drives
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8"x6", 6"x6", 6"x4" and 4"x3" Centrifugal Pumps
6—36"-g. Side Dump Cars and 4-ton Vulcan Locomotive

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1—3 ton per hour Kunts Hydrator. Each replaced for larger sizes. These are rebuilt and 100% efficient—90% new.
1—3 ton per hour Clyde Batch Hydrator.
We have a number of lime feeders and a number of hydrate feeders.
1—Portable Ingersoll Rand Air Compressor—315 cu. ft. per minute. Waukesha engine. First class condition—ready for use.
One complete Lime Hydrating Plant, including buildings.
One 212 Gallon Road Grader 12' Blade—Excellent condition.
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25 ton Orton Locomotive Cranes, new 1942, oil fired, 65' boom.
25 ton Ohio Locomotive Crane, gasoline powered, 55' boom, overhauled.
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20 ton Insley Steel Guy Derrick and Hoist.
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120 HP Atlas 6 cyl. Diesel Generator Set.
30 x 42" Pioneer Jaw Crusher, new.

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Conveyor Belting...Transmission Belting...Elevator Belting...Fire, Water, Air, Steam, Suction or Welding Hose, etc.

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CONVEYOR BELTING

ABRASIVE RESISTANT COVERS

Width	Ply	Top-Bottom	Covers	Width	Ply	Top-Bottom	Covers
48"	8	1/8"	1/16"	20"	5	1/8"	1/32"
42"	5	1/8"	1/16"	20"	4	1/8"	1/32"
36"	6	1/8"	1/16"	18"	4	1/8"	1/32"
30"	6	1/8"	1/16"	16"	4	1/8"	1/32"
30"	5	1/8"	1/16"	14"	4	1/16"	1/32"
24"	5	1/8"	1/32"	12"	4	1/16"	1/32"
24"	4	1/8"	1/32"				

Inquire For Prices - Mention Size and Lengths

TRANSMISSION BELTING

HEAVY-DUTY FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18"	6	10"	6	6"	5
16"	6	10"	5	5"	5
14"	6	8"	6	4"	5
12"	6	8"	5	4"	4
12"	5	6"	6	3"	4

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"A" WIDTH All Sizes | "D" WIDTH All Sizes
"B" WIDTH All Sizes | "E" WIDTH All Sizes
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EACH LENGTH WITH COUPLINGS ATTACHED

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2"	50 "	23.00
	25 "	13.00
1½"	50 "	20.00
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	25 "	6.25
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	25 "	7.50
	35 "	10.50
	40 "	12.00
1½"	50 "	15.00
	25 "	10.00
	35 "	14.00
	50 "	20.00

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I.D. Size	Length	per Length	Couplings
½"	25 feet	$5.00	$1.50 Pair
	50 "	10.00	1.50 "
¾"	25 "	6.25	2.50 "
	50 "	12.50	2.50 "
1"	25 "	10.00	3.50 "
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JAW CRUSHERS: Traylor 36 x 42, capacity 6" material 144 tons per hour, 4" material 76 tons per hour, manganese fitted, excellent condition. Also, sizes 12 x 24 to 48 x 60.

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VIBRATOR FEEDERS: Jeffrey Traylor 6' x 6', open pan deck, powered by four No. 5 heavy M-4 motors, including motor generator equipment for 440 volt, 3 phase, 60 cycle, operation; capacity 1500 tons of earth and stone per hour, maximum size stone 3" cubes.
1—48" x 10' with two 58M, 4 power units.

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No. 22B 36"x10", No. 10B 30"x13"
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160 HP Chgo. Pneu. Natl. Gas Engine.
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Shovel attach. for 41B Bucyrus-Erie
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1—150 cu. ft. 100 lb. pressure National Brake and Elec. Compressor direct driven by 30 HP 220 or 440 volt 3/60 motor with control.

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Price $3000.00

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NEW Philadelphia Speed Reducers, 16.7 H.P., 88 to 1 ratio, type HVT vertical, complete with couplings and motor base, one-half price.

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Delano Minnesota

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DIESEL UNITS
75, 90, 180, 200 HP. F. M. Engines.
175 KVA Worthington 3/60/2300.
275 KVA Fairbanks 3/60/2300.
343 KW. Fairbanks-Morse 3/60/480 V.
4—500 KW Baldwin 3/60/440 V.

BALL, ROD AND TUBE MILLS
5'x22" HARDINGE CON. Dry Ball Mill.
6'x22" HARDINGE CONICAL Pebble Mill.
8'x22" HARDINGE CONICAL Ball or Pebble Mill.
4x8, 8x6 & 10x9 Straight Ball Mills.
4x16, 5x18 & 5x22 Tube Mills 6'x22".
3½x8 & 5x7 Air Swept Tube Mills.
2x4½, 6x12 & 5x12 ROD MILLS.

PULVERIZERS
JEFFREY 24x20 & No. 1 Sturtevant Ring Roll.
RAYMOND Auto Pulverizer No. 0000, 0 & 3.

STEEL STORAGE TANKS
10,000 Gal., 15,000 Gal. & 20,000 Gal. Cap.

SEPARATORS AND COLLECTORS
8, 10 and 14 ft. Separators, Gayco & Bradley.

ROLL CRUSHERS
36x60 Fairmount & 36x20 Diamond.

JAW CRUSHERS
10x8, 13x7½, 14x7, 15x9, 15x10, 16x9, 16x12, 16x10, 18x11, 20x8, 20x6, 20x10, 20x12, 26x12, 30x15, 30x13, 36x15, 36x30, 36x18, 36x14, 36x9, 36x6, 36x10, 36x24, 42x9, 48x24, 48x36, 60x42, 84x66, 36x16, 9x36.

CONE AND GYRATORY CRUSHERS
5 No. 19, 25, 37 & 49 Kennedy.
18 in., 24 in., 30 in., 36 in. & 48 in. Symons Disc.
4—10 TZ Traylor 4 ft. Gyratory.
4—Nos. 5, 3 & 6 Austin Gyratory.
2—Traylor T-12 Bulldog Gyratory, also 16 inch 8 in. Traylor T. Gyratory.
17 Gates K—Nos. 3, 4, 5, 6, 7½, 8, 9½ & 21.
7—Symons Cone, 2, 3, 5½ and 7 ft.
6, 10 & 13 Inch Superior McCullys.

CONVEYOR PARTS
BELT: 1000 Ft. 60 In., 700 Ft. 40 In., 600 Ft. 36 In., 800 Ft. 30 In., 1642 Ft. 24 In., 517 Ft. 20 In., 297 Ft. 18 In., 500 Ft. 16 In., 300 Ft. 14 In.
IDLERS: 54 In., 42 In., 36 In., 30 In., 24 In., 20 In., 18 In., 16 In., & 14 In.
Head & Tail—Pulleys—Takeup for all sizes.
Steel Frames: 2,000 Ft. 24 in., 30 In., and 36 In. Sections.

ROTARY DRYERS AND KILNS
36 In.x20 Ft., 3 Ft.x30 Ft., 4 Ft.x30 Ft., 54 In. x30 Ft. 42 In.x24 Ft., 5 Ft.x30 Ft., 5 Ft.x16 Ft., 5 Ft.x60 Ft., 6 Ft.x60 Ft., 6 Ft.x20 Ft., 6 Ft.x70 Ft., 10x20, 7½x100 & 8x110 Ft. Kilns.

STEEL DERRICKS
GUY: 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 20 Ton 115 Ft. Boom, 50 Ton 100 Ft. Boom.
STIFF LEG: 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom, 25 Ton 100 Ft. Boom, 75 Ton 135 Ft. Boom.

LOCOMOTIVES
GASOLINE: 3 Ton, 5 Ton, 8 Ton, 12, 14 & 30 Ton.
STEAM: 9 Ton, 20 Ton, 40 Ton, 60 Ton & 80 Ton.
ELECTRIC: 2 Ton, 5 Ton, 8 Ton, 40 Ton.
DIESEL: 15 Ton, 30 Ton, & 65 Ton.

SCREENS
VIBRATING: 2x4, 3x6, 12x8, 3x8, 3x5, 4x5, 4x8, 4x10, 48x72 & 4x12, 1, 2 & 3 Deck.
HUMMER ROTEX, NIAGARA & ROBINS.
REVOLVING: 3x12, 3x16, 3½x18, 3x24, 4x16, 4x20, 4x23, 4x24, 5x30, 5x20, 6x20.

R. C. STANHOPE, INC.
Complete Plants Bought and Sold
60 East 42nd Street, New York 17, N. Y.

1—No. 108 Austin Gyratory Super Crusher Shop No. 3789.
Also
1—New Spider for above.
2—Sections of Hopper for above.
1—No. 5 Austin Gyratory Crusher Suspended Type Shop No. 2909.

NEWTON COUNTY STONE CO.
Kentland, Indiana

For Sale—

SHASTA DAM AGGREGATE PLANT AND CONVEYOR EQUIPMENT

INCLUDING:

1800—36" CHAIN BELT TROUGHING IDLERS.

LATE MODEL GE MOTORS, 200 HP., 1800 RPM., 2300/4000 VOLT, SLIP RING; COMPLETE WITH INTERLOCKING CONTROLLERS.

WESTERN GEAR REDUCERS, 200 HP., 40 TO 1 RATIO, HERRINGBONE GEARS.

8' x 12' MARCY ROD MILL, COMPLETE WITH DRIVE AND SPARE SET OF NEW MANGANESE LINERS.

DORR HYDROSEPARATOR, 20' x 4', COMPLETE WITH DRIVE UNIT.

8", 16" AND 20" DEEPWELL TURBINE PUMPS AND ONE 3" x 4" TWO STAGE HIGH HEAD CENTRIFUGAL PUMP, ALL COMPLETE WITH MOTORS.

30" BODINSON TRIPPER AND TRESTLE.

COLUMBIA CONSTRUCTION CO., INC.
Box 579 Redding, California

CONVEYOR BELTING IN STOCK FOR IMMEDIATE SHIPMENT

1800' 18" 5-ply Quaker
440' 18" 5-ply Hercules
2320' 18" 4-ply Hercules
1820' 24" 5-ply Hercules
2360' 24" 4-ply Hercules
530' 30" 4-ply Hercules
376' 30" 5-ply Hercules

All the above belting has ⅛ top and 1/32 bottom cover.

FRANK A. KREMSER & SONS, INC.
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PHILADELPHIA 40, PA.

Office Phone Regent 9-7272 **Night Phone** Hancock 4-7959

FOR SALE

General Electric 100 H. P. Super-Synchronons MOTOR

240 RPM; 2300 Volt, 3 phase, 60 cycle. Complete with motor panel for push-button control. Never used.

Suitable for Cement Mill or Crusher operation.

Write Box E-18, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

USED EQUIPMENT FOR SALE

1—Blaw-Knox Concrete Spreader 10-12 ft.
1—10-ton Acme 3-wheel Roller.
1—Jaeger Heavy Duty Triplex Road Pump 80-gal. min. 35 HP. Gasoline Engine.
1—Shovel Attachment for Model 42 Bay City Shovel.

THE HENRY H. MEYER CO., INC.
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FOR SALE

One new Rogers two drum hoist-band friction with 25 HP—220/440 volt motor V belt and gear driven.

SILICA PRODUCTS CO., INC.
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New "Western" Concrete Block Machines

Available for immediate delivery. Latest air automatic and electric vibrating machines. Capacity 1,500 to 4,000 block per day. $890 up, incl. motors; 14 cu. ft. mixers, batch hoppers and pallets at reas. prices.

B. & W. BRICK & MATERIALS CO
Room 1515 228 N. LaSalle St.
Chicago, Ill. Phone Dearborn 5655

TUBE MILLS — LIKE NEW

2—7'x24' Allis-Chalmers Two Compartment Tube Mills compeb design, complete new with the exception of the shell and heads.

Shell is ¾" plate, trunnion, head and main bearings of cast steel, liner plates are 3" thick and are made of a special abrasive resistant electric furnace steel. Main drive gear has cast teeth, semi-steel. Main pinion is hard tool steel.

Feeder mechanism is made of cast iron with steel parts. Feed screw running through the trunnion and carrying the material into the mill is made of the same quality electric furnace steel as the liner plates.

These mills will produce 9 tons clinker per hour of average hardness, all under 1¼", at a fineness of 85%, passing a 200 mesh screen. Grinding rocks of an average hardness, production will be about 15 tons per hour. Ball charge required is 35 tons.

1—No. 12 Allis-Chalmers Two Compartment Tube Mill, 6'x22', with Link Belt silent chain drive, complete. Reconditioned, ready for operation.

Shell is made of mild rolled steel plate. Heads are cast in one piece, semi-steel. Main gear is made of cast steel.

All of the liner plates, screen plates, etc., are made of a special abrasive resistant steel.

Production is 5 tons per hour with clinker of average hardness, all under 1¼" size at a fineness of 85% passing 200 mesh screen. Capacity in rock will be 8 tons per hour. This mill will require a ball charge of about 25 tons.

70 tons—¾" to 1¼" used chilled iron grinding balls.

WORTHINGTON AIR COMPRESSORS

4—1858 CFM Worthington Air Compressors, Type DC-2, size 23x14x14, 2-stage horizontal, 100 lb. pressure, 277 RPM with air filters, inter-coolers and after-coolers. Direct connected to 300 HP, General Electric synchronous motor, 3 phase, 60 cycle, 2300 volt, 277 RPM, .8 PF, complete with 5-step control and 5 KW MG set for excitation, 3 phase, 60 cycle, 440 volt input, 125 volt DC output with starter and control panel. Purchased new March, 1943. In excellent condition.

2—54"x14' Air Receivers, ASME Code, 125 lb. pressure.

1—66"x18' Air Receiver, ASME Code, 125 lb. pressure.

2—Schramm gas driven air compressor. Displacement 210 CFM, at a working pressure of 100 lb. Portable mounted on pneumatic tires with a spare set of steel wheels complete and self-contained. Purchased in 1945.

KILNS, PULVERIZERS, MILLS, DRYERS, equipment for cement mill operation—

GASOLINE DRIVEN POWER PLANT

1—Gasoline driven power plant, 28 KW or 35 KVA, Hercules Motor Corp. engine, 4¼x4¾, Model WXLC-3, Serial No. 180572, with U. S. Motor Generator, Type M-7, 220 volt, 3 phase, 60 cycle, 1200 RPM, Serial No. 2981, complete self-contained with panelboard.
Has a center tap, 110 volts, single phase.

MOTOR DRIVEN WELDERS
300 & 400 AMPERE
HOBART—GENERAL ELECTRIC—LINCOLN
Latest Type—New 1943—Reconditioned

check your requirements with

Heat and Power Co., inc.

70 PINE STREET | **WHITEHALL 3-2172** | **NEW YORK 5, N. Y.**

17—Model L1600 Cummins Heavy Duty medium speed diesel engines, 225 HP at 800 RPM, 6 cylinder, 7x10 bore and stroke, 2300 cu. in. complete with radiator and fan. Thoroughly reconditioned.

5—Model HP-600 Cummins Full Diesel, Cold Starting Power Units. 150 HP at 1800 RPM. Complete with radiators. Twin Disc clutches, equipped with gasoline, starting engines, mounted on steel sub-bases, with fuel tank built in.

36—New Chrysler-Hale high pressure pumping units. Hale centrifugal pumps, 500 GPM at 150 lbs. pressure, 346 ft. head, 4 in. suction, 3-2½ in. discharge outlets, direct connected to model T118, 80 HP, 6 cylinder, 3-7/16x4½ B & S Chrysler engines.

1—Sterling Viking 8 cylinder, 400 HP at 900 RPM gas engine, serial No. TC8-090, direct connected to Electric Machinery Co. AC generator, serial No. 79680, 200 KW, 900 RPM, 3 phase, 60 cycle, 440 volt, with 7½ HP DC belted exciter and one Panel General Electric switchboard, all mounted on heavy steel skid.

1—Fairbanks-Morse 360 HP type Y style VA, 6 cylinder, 257 RPM, diesel engine (cold head) No. 674386, direct connected to Fairbanks-Morse generator, 240 KW, 300 KVA, 257 RPM, 2300 volt, 3 phase, 60 cycle 80% efficiency PF serial No. 173914 with DC Exciter, and single panel switchboard.

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H. A. McCARTHY

310 Thompson Building

Tulsa, Okla. **Phone 5-3296**

FOR SALE

Williams Universal Fine Grinder, 15-20 tons per hour, ¼ in. minus material, direct connected to 100 H.P. Buda Diesel on Steel Skids.

Perfect Condition—Price $3500

Fob: Mercersburg, Pa.

Fry Coal & Stone Co.

Phone Mercersburg 51

Having had duplicate order, we can offer for sale—1—4000 lb. Lewis-Shepard gasoline operated Lift Truck. Used two weeks, sold with manufacturer's guarantee as new. Lift height—103", collapsed height—83". Cushion tires. Immediate delivery.

UNION CONCRETE PIPE COMPANY
Ceredo, W. Va.

B-Erie 1¼ yd. gas-air GA-3 shovel, rebit.
Bucyrus 2 yd. 50B steam shovel.
Marion 4 yd. elec. shovel, Model 125.
Monighan elec. Walking dragline, 3 yd.
Bucyrus-Erie 52B Diesel dragline-shovel.
Allis-Chalmers 12K—27" Gyratory crusher.
A-C Superior 54"x24" crushing rolls.
25 yd. Diesel truck-trailers, bottom dump (7).
Porter, Vulcan 18 ton stm. locos., 36" rebit.
Whitcomb 8 ton gas locos., 24" ga., (4).
Steam locos., 27 to 50 tons, std. & 42" ga.
H. Y. Smith Co. 828 B'way, Milwaukee, Wis.

1—2 yd. high dump Smith truck mixer mounted on 1939 two ton open cab Dodge with 1945 motor. $2000. Truck and mixer now operating.
1—Quinn culvert pipe machine, without mixer, complete molds and pallets, 12" to 36".
GROHNE CONCRETE PRODUCTS CO.
Decatur, Illinois

LOCOMOTIVE CRANES

1—20 ton Orton, Ser. No. 48730, gasoline powered, 40' boom.
1—25 ton Ohio Mdl. E. Ser. No. 3722, steam powered, 50' boom.
1—35 ton Browning No. 8, Ser. No. 1734, steam powered, 42' boom.

AIR COMPRESSORS

Portable and stationery, belt with elec. or gas power, sizes from 20 cu. ft. 1,000 cu. ft.

CRUSHERS

1—Acme Style D No. 9½ Jaw Crusher, with screen, elevator and gas eng., 12 to 18 tons per hour.
1—9½x24" United Iron Works Jaw Crusher.
1—12x20" Acme Road Machinery's Jaw Crusher, Ser. No. 1873, Style A.
1—9x16" Climax Jaw Crusher No. 2.
1—9x16" Acme Jaw Crusher No. 1686, size 8½A.
1—9x18" Sawyer Massey Jaw Crusher.
1—No. 5 Allis-Chalmers Gyratory Crusher, No. 5331, size 10x38".
1—No. 5 Austin Gyratory Crusher, Ser. No. 2945, size 12x35½".

DERRICKS

4—Steel guy derricks, 2—20 ton American steel guy derricks, 110' masts, 90-100' booms, 1—15 ton American steel derrick, 83' mast, 75' boom, 1—5 ton Terry Guy Derrick, 70' mast, 60' boom.
18—Stiffleg derricks, 1—62½ ton Insley, 54' mast, 70' boom, 16—30 ton BRAND NEW Wiley Derricks, 30' masts, 60' booms, 1—15 ton All Steel derrick, 25' mast, 90' boom.

Construction moves at a faster tempo in the Air-Age. BUY or RENT speedy, dependable Equipment from E.C.A.

HOISTS (Electric, Gas, Steam)

85—Electric, ranging from 30 H.P. up to 125 H.P. consisting of triple-drum, double-drum and single drum, with AC or DC motors, some with attached swingers. Following makes: American, Clyde, Lambert, Lidgerwood and National.
Gas hoists ranging from 8 to 120 H.P., single, double and triple-drum all standard makes (38 in stock).
Steam, ranging from 8 H.P. to 60 H.P. in single, double and triple-drum; all standard makes.

PNEUMATIC TOOLS

Column Drifters and Tripods

4—Model 17 Denver rock drills.
3—Sullivan high-speed drills, Model FG-3.
5—Ingersoll Rand type X71 drifters.
4—Gardner Denver drills with drifter mountings.

JACKHAMMERS

8—Jackhammers, consisting of Hardsoco, Worthington and Cleveland. 45 lb. and 85 lb. class.
4—Ingersoll Rand Model BCR-430 jackhammers, 47½ lb.
1—No. 3 Hardsoco 50 lb.

WAGON DRILLS

2—Gardner Denver derrick drills with Model 21 Gardner Denver drill; will drill 30 ft.
1—Ingersoll Rand drill, size D, with utility air hoist and Ingersoll Rand X71 drill.
1—Ingersoll Rand Model FM-2 drill, with Ingersoll Rand air hoist, size X71 drill, mounted on pneumatic tires; will handle 20 ft. steels.
2—Ingersoll Rand; Model FM-2, with air hoist and 1X71 drill mounted on 3 steel wheels; will handle 20 ft. steels.
1—Ingersoll Rand drill No. 3122, with X71 drill, mounted on 4-wheel trucks; will drill up to 36 ft. deep holes.

WE ALSO HAVE A LARGE STOCK OF DRILL STEEL WITH MISCELLANEOUS TIMKEN BITS.

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We have a large stock of centrifugal pumps, gas and elec. powered from 1½" to 10". Also Dredging and vertical pumps.

PARTIAL LIST ONLY—SEND FOR NEW STOCK LIST JUST PUBLISHED

All equipment is owned by us and may be inspected at one of our plants.

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One (1) Flory Single Drum Hoist without motor. Drum 48" dia. Face 42", Shaft 4⅞" in. Condition good.
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One (1) Link Belt Rotating Screen 4'x16' complete, and extra screens. Condition good.
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One (1) Diamond T Dump Truck. Model 1938, Mfg. No. 509S5090470. Condition good.
One (1) Diamond T Dump Truck. Model 1938, Mfg. No. 4060391. Condition good.
One (1) Dodge Dump Truck. Model 1936. Mfg. No. 8390029. Condition fair.
One (1) Dempster-Dumpster Unit No. 764 LF, Model 200 LF with five (5) Model 200 LF Boxes. Condition good.

SPECIAL BARGAINS from STOCK

2 Bay City Truck Cranes cap. ½ yd.
20-ton Orton Standard Gage Gasoline Locomotive Crane, MCB Couplers.
8-ton BS Tandum Gas Roller.
10-ton AW 3-Wheel Gas Roller With Scarifier.
2 Northwest Crawler Gas Cranes and Draglines, cap. 1 yd.
Brownhoist Crawler Gas Crane and Dragline ½ yd. cap.
Buyers Bear Cat Crawler, Gas Crane ½ yd.
All above equipment overhauled by our men ready for work.

THE ACME EQUIPMENT COMPANY
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DIESEL ENGINE SETS FOR SALE

2—200K W 3/60/220v. 900 RPM NEW
2—102K W 3/60/220v. 1200 RPM 8 hrs. used
1—175K W 3/60/240v. 514 RPM A-1
1—200K W 3/60/480v. 514 RPM A-1
1—300K W D.C. 250v. 275 RPM A-1
also others available

STEPHEN A. DOUGLASS CO.
630 Ft. Washington Ave., N. Y. 33, N. Y.

FOR SALE

1—46" R. H. Fuller-Lehigh Pulverizer Mill Screen type arranged for coal grinding. Also 1 screw feeder for 46" Fuller Mill.

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DEPENDABLE USED MACHINES

Special, P&H Model 700, 1¼ yd. dragline, 50' boom; rebuilt

A-C "L"; Baker bulldozer
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4x10 single deck screen
Lorain 1¼ yd. Diesel shovel.
Universal truck crane

All above equipment reconditioned in our own plant.

3520 W. 51st Street **TRACTOR & EQUIPMENT** **Chicago 32, Illinois**

¾ yd. Northwest shovel and crane, crane boom 40'. Good condition.
350' centers 30" rubber belt conveyor, comp. w/ 30 HP motor, starter, drive head tail pulleys, top and bottom idlers.
Never used electric motor 50HP 1750 RPM, 220-440 volt.
4" centrifugal sand pump, belt drive w/ base.

SOUTH RIVER SAND CO.
Old Bridge, N. J.

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Koehring Model 801 Diesel shovel, 2 yards.
Lorain 75B 1½ yd. shovel and crane.
Link-Belt Diesel crane 1¾ yd. with 60′ boom.
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Marion 37 shovel, steam, 1¾ yds.
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Marion Model 450 gas-elec. shovel, 1¼ yds.
Marion Model 33I gas shovel.
Koehring 301 shovel-crane ¾ yds.
Lorain 55D 1 yard shovel.
Insley ½ yard, ¾ rev. shovel.
Northwest Model 104, 1¼ yd. crane, boom 70′.
P & H 400 shovel-crane ¾ yds. capacity.
P & H 600 crane, 1 yd. capacity.
Universal 35, shovel-crane-backhoe, ½ yd.
Lorain 40 truck crane, 8 tons capacity.
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Monighan 2½ W. Diesel dragline, 92 ft. boom.
Osgood 1 yd. shovel-crane.
Bucyrus-Erie elec. tunnel shovel, 1 yd.
Osgood 1½ yd. shovel.
Osgood shovel, 1¼ yds. gas.
Byers Bear Cat ½ yd. crane.
Byers Bear Cat ½ yd. backhoe and crane.
McMyler 20 ton loco. steam crane.

TRACTORS AND MISCELLANEOUS

International TD14 tractor with bulldozer.
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Caterpillar D6 tractor with 6 yard scraper.
D7 trackexcavator.
Allis-Chalmers HD-10 tractor and angledozer.
Allis-Chalmers HD10 tractor and 6 yd. scraper.
Allis-Chalmers LO with eight yard scraper.
Gallon Grader Model EZ, dual pneumatic.
Allis-Chalmers W8 tractor with bulldozer.
Cletrac 40D tractor with angledozer.
Allis-Chalmers K tractor with bulldozer.
Allis-Chalmers Model L tractor with bulldozer.
Allis-Chalmers LO tractor with 7 yd. scraper.
International TD 18 tractor with bulldozer.
International TD 40 tractor with bulldozer.
Buffalo-Springfield 10 ton 3 wheel road roller new 1941.
2 Dempster Dumpsters with 20 buckets.
Drill steel, 1¼", bitted and shanked.
500 drill bits, 1-R and Timken. Various sizes.
Several dredge pumps available from 6" up.
3 Euclid Model 1-ZWCL dump trucks.

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Smith 1½ yd. tilting mixer 30 hp. electric drive.
2 Jaeger 3-yd truck mixers, unmounted.
2 Jaeger 5 yd. truck mixers, unmounted.
2 Jaeger 7 yd. truck mixers, unmounted.
Rex 3 yd. transit mixer on Mack truck.
Ransome 14S mixer, steel wheels, power loader.
Koehring 28S Electric, on skids.
3 Rex 5 yds. truck mixers, unmounted.
Mixer 28S, Smith electric stationary.
Mixers, two Ransome 42S, elec. Right and left.
Mixer, Koehring 28S, gas, skid mounted.
Mixer, Jaeger 14S, on pneumatic tires.
Fuller Kinyon bulks cement unloader portable.
Koehring 34E dual drum paver.

ASPHALT PLANTS

Standard Plant 3000 lb. cap. Complete, self-contained, including Diesel generating set.
Cedar Rapids Portable 60-80 tons per hour cap.

CRUSHERS—CRUSHER PLANTS

Roll, 54x24, 54x20, 48x36, 30x24.
Allis-Chalmers 42" gyratory.
Gyratory crusher: K.V.S. 30, 37-S, 49; 32, 8A, 8B; Traylor 8"; McCully, 13", 8", 6".
Allis-Chalmers 6" fine reduction crusher.
Jaw: 6x12, 9x16, 10x20, 14x24, 12x30, 13x30, 16x32, 24x50.
Complete Rock Crushing, Sand and Gravel Plants.

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Blaw-Knox ⅞ yd. Clam, digging.
Hayward ⅞ yd. Clam, digging.
½ yd. Haiss Clamshell, rehandling.
10 Battleship 2-3 yd. steel stone skips.
Hayward ⅝ yd. Standard Orange Peel.

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Mack 60 ton std. ga. gas locomotive.
Whitcomb 20 ton 36" ga. Diesel loco. Rebuilt.
Baldwin-Westinghouse 25 ton elec. loco., std. ga.
American 45-ton, steam, saddle tank.
Vulcan 30-ton, steam, saddle tank.
Vulcan 25-ton, steam, side saddle loco.
Vulcan 8-ton, std. gauge, gas.
Vulcan 6-ton, gas, 36" gauge.
Porter 12-ton, saddle tank, steam, 36" gauge.
3 Western Steel, 20 yd. air dump cars.

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30 Church St. New York, N. Y.
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NEW ROCK BITS

Timpkin 4 point side hole 20c ea. lots of 1000.
I. R. Type one 4 point 15c ea, lots of 1000. New drill steel ½ price.

G. W. KAUFMAN
Markley Road Cincinnati 30, Ohio

For Sale—A Good Time to Buy

Switcher 6 wh. 60 ton sep. tender
Ore Bridge 10 ton 25c ft. span 73′ lift
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Gyr. Crushers 12"T-10"B-2' 4"T. (3) 7½
Steel storage tanks (10) 10 ft. x 30 ft.
Bucket loader Haiss 30-draglines (3) diesel
Street sweeper Elgin gas-Hydrator Kritzer 3 ton
Clam bucket 1⅝ yd. single line

A. V. Konsberg 8 S. Dearborn St. Chicago

DIESEL POWER

82,550 HORSEPOWER

For Your Selection

Modern—Immediate Delivery
Complete Plants

1—3—4—6 Engine Generator Plants
Engine Generator Sets 1800 H.P.
1500 KVA Capacity and Smaller Sets

Fairbanks-Morse	Busch-Sulzer
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PORTABLE POWER UNITS

International Harvester Caterpillar Cummins
Buda Superior Waukesha Sheppard Lister
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Shops and Warehouse: Jersey City, N. J.
Specify Your Diesel Power Requirements

A. G. Schoonmaker Company
Power Equipment

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NEW YORK 7, N. Y.
Business Established 1898

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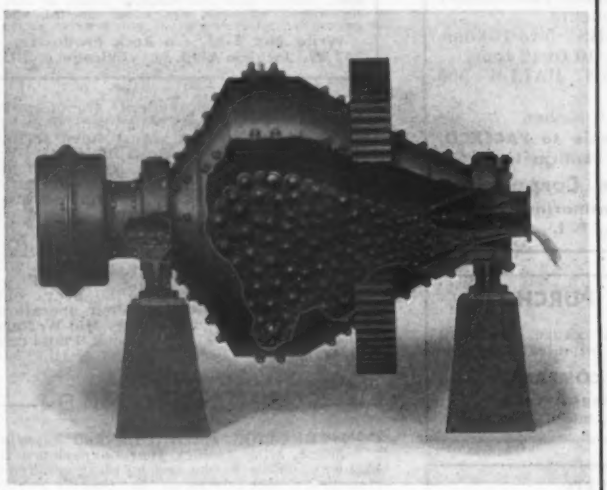

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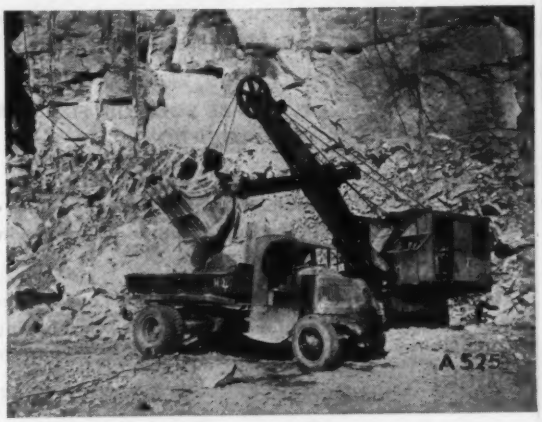
1½ Yard Renewable Lip Dipper Handles 1,000 Tons of Blasted Rock Per Day . . . .

The 34-B Bucyrus-Erie shovel with a 1½ yd. Amsco Renewable Lip Dipper shown in Picture A-525 appears old and battered, as it has been in rugged service for ten years. Yet the picture also discloses hard digging conditions and the ability of shovel and dipper to carry on in tough going in a quarry at Guilquarry, N. C.

The unit is handling 1,000 tons or more per day of blasted rock to the crusher. The crushed stone is used for various concrete purposes, and also for railroad ballast.

Long, economical service in handling destructive materials is characteristic performance for Amsco Renewable Lip Dippers. Made of tough, austenitic manganese steel, they offer staunch resistance to repeated shocks and continuous abrasive wear. The use of "the toughest steel known" also make possible dippers of optimum weight without sacrifice of strength.



The design of Amsco Renewable Lip Dippers is based on a generation of experience in making dippers for rugged service. This design, shown in Picture R-551, allows fast digging and dumping, and full loads with the least expenditure of power. First class digging and loading performance is given by the scoop-like lip design shown in the picture, which penetrates material readily and reduces resistance at the sides by rolling the material inwardly, thereby minimizing the "crowding" power required.

R-551. 1½ yd. Amsco Renewable Lip Dipper for Lima Shovel.

The renewable lip, with integral lip rigidity, has reduced dipper costs substantially as a wearing part that is readily replaced. Amsco's method of attaching lip to body makes replacement in the field an easy task.

Amsco Renewable Lip Dippers are available in all standard sizes from ¾ yd. capacity up. Bulletin 743-M describes all the uses for "the toughest steel known" in quarries and mines.

Joliette Steel Limited, Joliette, Quebec, owned by American Brake Shoe Company, produces and sells Amsco Manganese Steel Castings in Canada.

AMSCO

Foundries at
Chicago Heights, Ill.; New Castle, Del.;
Denver, Colo.; Oakland, Calif.;
Los Angeles, Calif.; St. Louis, Mo.
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157-7

ACCO-LOC SAFETY SPLICE

No Distortion of Rope Structure

Always 100% Efficient

Note from this unretouched photograph how the six strands of the dead end have been pushed down and locked into place—and how the six strands of the pull or load rope have not been distorted in any way. Such lack of rope distortion would be impossible with the old, obsolete hand-tuck splicing.

When you cut the ACCO-LOC Safety Splice with an abrasive cut-off machine you see, by cross-section, why this new and revolutionary method for making wire rope endings is so efficient. Not the slightest distortion of rope structure; maintains equalized stresses in all strands; no off-center pull on the load rope.

More than being 100% efficient, the ACCO-LOC Safety Splice is safe. No seizing wires to loosen; no wire ends to barb. Extremely flexible and easy to handle. Send today for fully detailed literature.

ACCO

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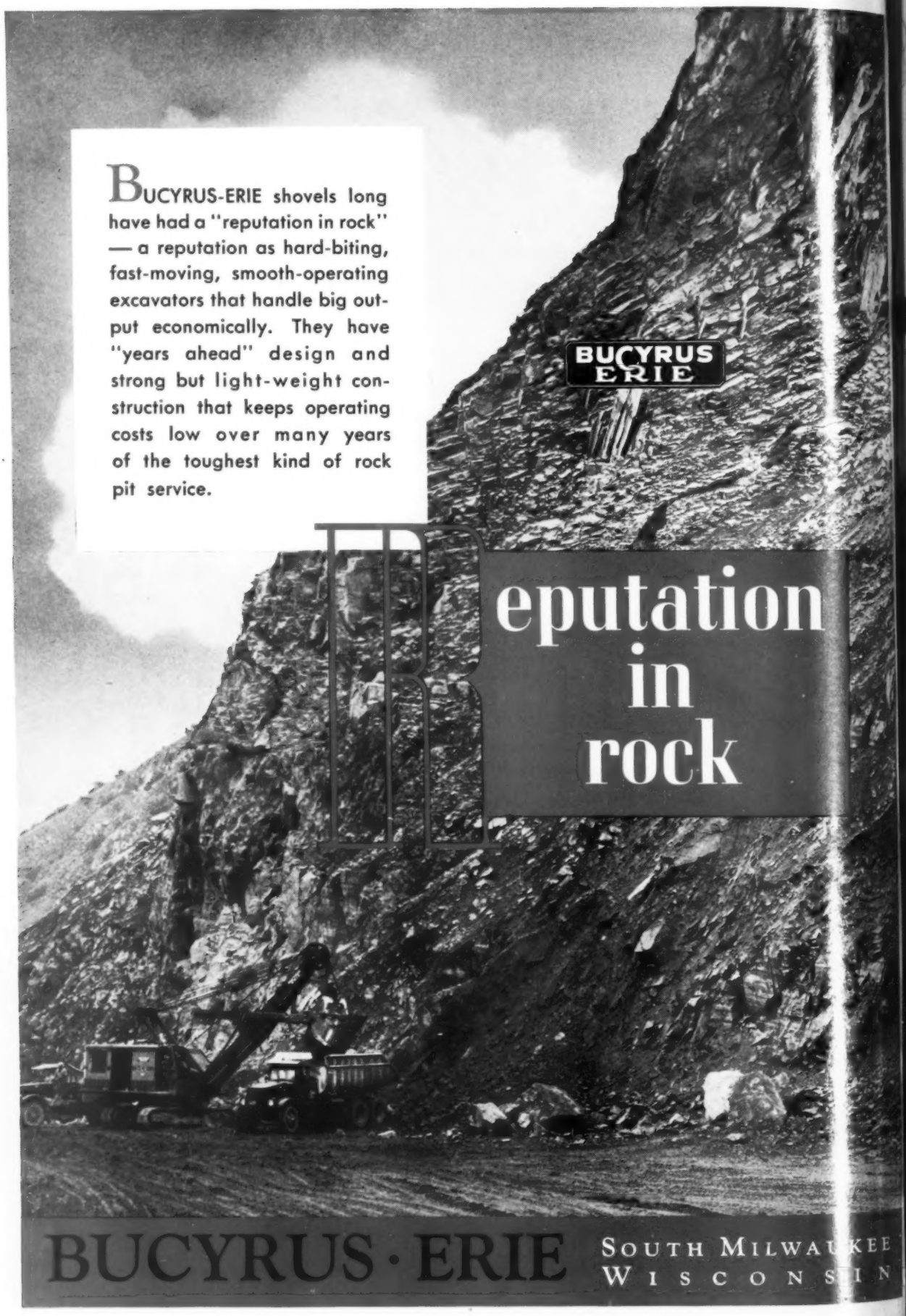

BUCYRUS-ERIE shovels long have had a "reputation in rock" — a reputation as hard-biting, fast-moving, smooth-operating excavators that handle big output economically. They have "years ahead" design and strong but light-weight construction that keeps operating costs low over many years of the toughest kind of rock pit service.

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